

EMPIRE AND ARCHITECTURE
AT 16th-CENTURY PUERTO REAL, HISPANIOLA:
AN ARCHEOLOGICAL PERSPECTIVE

BY

RAYMOND F. WILLIS

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Raymond F. Willis

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Throughout this dissertation I have made extensive use of graphics to illustrate concepts within and supplementary to the text. If I have been successful in this attempt to combine the visual and the written it is largely due to the lessons I learned from my cartography instructor Dr. John Dunkle, Professor of Geography.

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AN ARCHEOLOGICAL PERSPECTIVE

By

Raymond F. Willis

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Chairman: Jerald T. Milanich
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Archeological investigation of a large masonry structure, centrally located within the imperial Spanish grid town of Puerto Real, Hispaniola (1503-1578), showed it to be a single-nave masonry church with an attached walled masonry courtyard and pole-and-thatch open chapel. Also included within the central sector liturgical complex is a cemetery and what appears to be a massive masonry tower attached to a pole-supported tile-covered portico. Evidence is also presented suggesting an open-air marketplace located in front of the church. Methodologies utilized in the field include exploratory trenches, areal excavation, test pit grid, test pit transects, elevation contour mapping, electrical resistivity mapping, and computer-generated artifact density SYMAP contour mapping.

The life cycle of Puerto Real is mirrored in the succession of structures at the church site:

- 1) 1503 to 1510⁺5, imperial "beachhead"--bohio and palisade;
- 2) 1510⁺5 to 1578, imperial Spanish--masonry church; and,
- 3) 1578 to 1605, imperial dissolution--squatter lean-to.

Both the imperial Spanish grid town and the liturgical complex were major mechanisms of conquest. Their initial configuration was established informally on Hispaniola at the dawn of empire at sites such as Puerto Real and was formalized a half century later as empire encompassed Tierra Firme.

CHAPTER I INTRODUCTION

The Puerto Real project, of which the excavations described here form the baseline study, is a joint project of the Haitian government, the Organization of American States (OAS), and the University of Florida (UF). A major goal of the project is to develop a historically accurate reconstruction of the early imperial Spanish town of Puerto Real (1503-1578) and to provide information which could be used for an interpretive museum in Haiti. Through this project and other cooperative educational programs these three institutions seek to broaden the awareness of the joint cultural heritage which exists between the peoples of the Americas, of whom all are recipients in some degree of the Indian, African, and European cultural interaction which began nearly five-hundred years ago on Hispaniola at such sites as Puerto Real. Coordinating the project with the impending Quincentennial Celebration (1992) of Columbus' discovery of the New World will insure that a global audience will benefit from these efforts.

The nurturing of this project began with the efforts of Albert Mangonés, representing the Haitian government through ISPAN, and Dr. William Hodges of the

Hôpital le Bon Samaritain in Limbè, Haiti. Initial funding for the 1979 field season was provided through Ragnar Arnesen, Director of Haiti's OAS office. During the 1979 season, UF's Vice President for Academic Affairs, Dr. Robert Bryan, sent a fact-finding mission to assess the potential of this project and this graduate student's archeological excavations.

This mission included Dr. Charles H. Fairbanks, Distinguished Service Professor in Anthropology and moving force behind the initiation of the Puerto Real project; Dr. Terry L. McCoy, Associate Director of the Center for Latin American Studies; Dr. William Maples, Chairman of the Department of Social Sciences at the Florida State Museum; and, Dr. Kathleen A. Deagan, Assistant Professor of Anthropology at Florida State University (Tallahassee). Based on the positive report of these individuals, Dr. Bryan initiated funding of the project on behalf of UF, matching that of OAS in 1980 and continuing major financial and moral support for all subsequent field seasons.

The primary goals of the archeological investigation reported here and conducted in 1979 and 1980 were to determine the form and function of the masonry structure (Building A) represented by the largest rubble pile at the center of the town of Puerto Real and the site of the three carved stone gargoyles found there by Dr. William Hodges in 1975. The 1979 and 1980 investigations entailed

the excavation of 122 2 X 2 m units over the entire structure plus the digging of 392 50 X 50 X 20 cm deep test pits on a 5 m grid over an 80 X 100 m portion of the town's central sector surrounding Building A. Prior to excavations this area was contour-mapped in 10 cm intervals. Graduate student and excavation supervisor Gary Shapiro conducted an electrical soil resistivity survey of this central sector in the 1980 season.

Jennifer Hamilton, graduate student and excavation supervisor, and Paul Hodges, site manager and official photographer, conducted an extensive test pit transect survey delineating the extent of the town and contour-mapped four hectares of the site in 10 cm intervals. Rochelle Marrinan, the 1980 field cataloger, collected contemporary Haitian vertebrate specimens for the Florida State Museum's zooarcheological type collections. Dr. William Hodges conducted a 2 X 3 m test excavation of an extended human burial along the western periphery of the central sector.

These investigations determined Building A to be a single-nave masonry church with an adjoining pole-and-thatch open chapel. Connected to the rear of the church was a walled masonry courtyard. Evidence for a large masonry tower immediately west of the church and an open-air market situated in front (south) of the church was also discovered. Finally, a continued-use cemetery was found 20 m west of the church.

This study provides a sound archeological and architectural baseline for further work at Puerto Real. The physical data necessary to aid the Haitian government in its eventual reconstruction of the church and a large portion of the central sector of town, sacred and secular, are presented. These data are also utilized to examine the formal and informal development of imperial mechanisms of conquest implemented and developed at Puerto Real, Hispaniola, in 1503 under the governorship of Nicolas Ovando. The two most important mechanisms investigated here are the architectural planning concept of the grid town and the liturgical architectural adaptations to the New World. These adaptations resulted in the single-nave monastic church and the uniquely designed New World open chapel which served to enhance imperial efforts of directed cultural change among the New World aboriginal populations. Both adaptive forms were present at Puerto Real.

CHAPTER II HISTORICAL AND CULTURAL SETTING OF PUERTO REAL

In this study the colony of Puerto Real is viewed as a cultural phenomenon which exemplifies the interdependency of the many variables comprising the Spanish New World empire. At its founding in 1503, Puerto Real, one of the fifteen perimeter colonies on Hispaniola, was part of the first organized and competently administered Spanish attempt at colonization of the New World following the failures of Navidad and Isabela(Figure 1).

Prelude to Empire

It is well to keep in mind the long-standing cultural diversity found in Spain when assessing the results of Spanish colonization of the New World. A comprehension of this diversity, its benefits as well as drawbacks in relation to empire, is necessary to understand how the Spanish New World empire functioned effectively for over two centuries while encompassing a land area of nearly 5,000,000 square miles. Such knowledge helps to explain why Latin America exhibits such a unified cultural appearance today.

Addressing the matter of Spain's cultural diversity, Foster (1960:13) states:

The limitation of this conception is apparent when we realize that sixteenth-century Spain consisted of a series of regional nuclei--the Castiles, Aragon,

Figure 1. Ovando's Fifteen Towns

Map of Hispaniola compiled from André Morales' survey of 1508. It is referred to in Sauer as the "Bologna copy", drafted in 1516 and now housed in the library of the University of Bologna, Italy (Sauer 1969:41).



Catalonia, Glacia, Extremadura, Andalusia, for example - each with cities, towns and villages, and each with marked provincial characteristics but all bound together on a national level by political forms, religion, economic activities, history and some awareness of identity of interest. Each of the traditional major areas of Spain contributed a complete sociocultural system, representing roughly the same ranges in complexity from urban-elite to village-peasant as all other areas. Any one of these nuclei, if it alone had conquered large parts of America, could have supplied a complete culture which would have set off the acculturation process.

These regional Spanish nuclei have been traditionally referred to as "kingdoms" and are listed below (from Foster 1960:27).

<u>Kingdom</u>	<u>Province</u>
Galicia	La Coruña, Pontevedra, Lugo, Orense
Asturias	Oviedo
Las Vascongadas (Basque Provinces)	Vizcaya, Gúipuzcoa, Alava
Navarra (Navarre)	Navarra
León	León, Zamora, Salamanca
Castilla La Vieja (Old Castile)	Santander, Palencia, Burgos, Logroño, Valladolid, Avila, Segovia, Soria
Castilla La Nueva (New Castile)	Madrid, Guadalajara, Cuenca, Toledo, Ciudad Real
Extremadura	Cáceris, Badajoz
Andalucia (Andalusia)	Huelva, Sevilla, Córdoba, Cádiz, Málaga, Granada, Almería, Jaén
Murcia	Murcia, Albacete
Valencia	Castellón de la Plana, Valencia Alicante
Aragon	Huesca, Zaragoza, Teruel
Cataluña (Catalonia)	Gerona, Barcelona, Lérida, Tarragona

Spain's ability to harness and direct the varied talents of these Iberian kingdoms, along with those of foreign economic and intellectual "colonies" within its borders (such as the large Genoese population in Castile), was an important factor in making the discovery, conquest, and administration of the New World possible. Both Catalonia and Aragon had long experience in colonial and commercial ventures in North Africa and the Levant. The Basques provided vast experience through years of Atlantic deep sea fishing, piloting, and ship building. Portuguese mariners were largely responsible for the development of the caravel, "the stout square-rigged vessel which was to be the essential instrument of European overseas expansion in the late fifteenth and sixteenth centuries" as well as navigation and cartography under the reign of Prince Henry the Navigator (Elliott 1963:55).

Perhaps the most important synergistic effect occurred during a period of economic stagnation when the federated kingdoms of Aragon and Catalonia were united with Castile, then reaching its economic and military might. This union was, of course, the marriage of Ferdinand and Isabela in 1469.

In the Union of the Crown, youth and experience walked hand in hand. The dynamism which created an empire was supplied almost exclusively by Castile--a Castile whose vigour and self confidence gave it a natural predominance in the new Spanish Monarchy. But behind Castile stood the Crown of Aragon, rich in administrative experience, and skilled in the techniques of diplomacy and government. (Elliott 1963:43)

Interestingly, the economic vigor and self-confidence of Castile was due in large part to the influx of a skilled Genoese merchant class during the 14th and 15th centuries. These merchants secured control of the lucrative wool trade out of Spain's southern ports (Elliott 1963:38). The non-labor intensive wool trade increased in economic importance, removing large numbers of males from the labor force and freeing them to fight the royal wars (i.e., Reconquista). Economic growth also provided the crown with the funds to pay for military ventures. Thus during the 16th century in Spain we see the Basques providing the sailing skills, Castile the warriors and dynamism, Aragon the bureaucratic experience, and the Genoese the financial resources and management skills to successfully establish a working empire in a New World.

The contrast between the diverse cultural areas within Spain and the apparent unified Iberian legacy in Latin America is striking. As Gillin has noted, the enormous Latin American culture area shares generic Spanish similarities which override and engulf diversified local aboriginal cultural characteristics. "There is a common pattern of customs, institutions, and ethos that characterize modern Latin [read Hispanic] American society as a whole . . ." (Gillin 1955:488).

Three of the most basic and striking similarities are language, religion, and town planning. The unified nature of these key cultural factors was not a product of

mere chance but was the result of directed culture change and the imperial planning of 16th-century Spain. These factors are also three key components of Foster's "conquest culture," a culture contact model in which the donor culture is separated by formal or informal selection processes into basic cultural elements which are transferred by force or selection to the conquered culture (Foster 1960:14).

In the case of Latin America these three elements were rigidly defined and "formalized" conceptualizations of the Iberian ideal, an ideal impossible to attain in the homeland due to its long history of regional cultural diversity. This ideal could be enforced upon the shattered remains of the conquered New World aboriginal populations as well as the culturally diverse Iberians who settled the New World. Imperial Spain consciously and formally sought to bring its own form of order to the New World through directed enforced culture change.

Foster (1960:14) describes the "reduction" or "stripping down" of the Iberian donor culture as follows:

The mechanisms whereby many traditional Spanish elements were discarded are found in the formal governmental and church decisions involved in selection of desired existing forms and the creation of new ones. . . . Formal processes, for example, produced standardized municipal organizations, as contrasted to the variety of local Iberian forms, and it produced the grid-plan town in place of the loosely planned or completely unplanned Spanish community of the sixteenth century. Formal processes likewise congregated Indians in villages, governed commerce and trade, and introduced an ideal of theologically purified Catholic dogma and ritual to America.

Another event was concurrent with the crystalization of economic and navigation systems important to Spain's New World empire. Elio Antonio de Nebrija (1444-1522), a grammarian and lexicographer who held the post of historiographer royal, published a Castilian grammar in 1492, the first grammar compiled of a modern European language (Elliott 1963:125). In response to Isabela's question of the importance of this grammar the Bishop of Avila replied on Nebrija's behalf, "language is the perfect instrument of empire" (Hanke 1959:8). The administration of empire became a manageable task through a unified language.

Coinciding with the recognition of language's power to control was the invention less than fifty years earlier of the printing press. It was not until the last quarter of the 15th century that the potential for this form of communication began to be felt in Europe. However, as the 16th century approached, the number of printing presses increased dramatically and by the 1580s Spain possessed at least thirteen distributed among Barcelona, Burgos, Salamanaca, Seville, Valencia, and Zaragoza (Hirsch 1967: 115). Spain now possessed the medium capable of spreading standardized imperial conceptions of such complex patterns of thought as a Castilian grammar among the masses and across the ocean.

To reach these masses with the word of imperium was a major task of the Catholic Church and mission systems. The Catholic Church not only brought a more unified and

"stripped down" version of its Old World self, one designed to replace native American belief systems, but it also was the primary formal instrument of language instruction among conquered aboriginal population. Combined with the fact that Castilian was the official language of the Spanish court and the bureaucracy (Elliott 1963:125), the church's influence assured that a unified Spanish language would come to dominate Latin America.

The functional role of the Catholic Church in Spain's conquest of the New World cannot be overstated. However, the church, the military, and the Spanish imperial administrative bureaucracy all combined efforts, resulting in a dynamic synergism capable of controlling and exploiting a New World. Fernando de los Rios (1967:53) describes this synergism:

. . . Spain was impelled to two kinds of militant action at that momentous period of her history: the one militarist the other spiritual, both combative and eager to conquer; in the former the purpose to conquer power, territory, and riches prevailed, in the latter the prime aim was to win adherence to Christianity. There was an interweaving between the two, a mutual aid that engendered phenomena of social symbiosis of great juridicial and political importance. A realization of the permanent interrelation between two organisms, each of which depended for its existence on absorbing a part of the vital juice of the other, is quite fundamental for the understanding of Spanish colonization. The will to power and the will to imperium, in the double dimension so loved by the Renaissance, material and spiritual, reached through Spain to its apex.

The New World witnessed in the 16th century a Spanish presence in which the church defended the divine sanctity of kings and the crown upheld the ecumenical

authority of the Roman Catholic Church. The clergy greatly increased in number, political power, social power, and wealth under Ferdinand and Isabela's policy of racial and religious unification. However, Ferdinand and Isabela, always cautious in matters of power, kept the church in the New World under their direct and immediate control in all matters except doctrine and religious discipline (Haring 1952:166,167).

The third formalized, culturally unified, major structure developed just prior to discovery and enforced on the Spanish-New World experience was that of the grid-town plan. This represents a conscious effort of Spain to provide an ideal, ordered, constructed environment in a frontier setting. The grid-town plan might be suggested to represent a physical manifestation of the synergistic structural interplay of church, military, and official administrative bureaucracy of empire in the New World. A strictly defined patterning of structures allowed the settlers to directly impose some form of tangible order upon the alien, chaotic, and at times frightening environment in which they found themselves. It allowed a physical manifestation of the order necessary to successfully carry out the mandates of empire. The grid-town plan provided order, security, and a feeling of common purpose. It epitomized the Spanish ideal of the New World--a clean slate upon which to order Spanish civilization.

This architectural-planning concept was not widely practiced in Spain in the 16th century; the unplanned growth of towns and villages since Roman times had left tangled urban webs which contrast starkly with the clean-cut orderliness of the grid-town plan. One major reason for the lack of grid-town establishment in Spain was that, being intensively occupied for over a millenium, the majority of townsites had already been established prior to the 16th century. Interestingly, one of the earliest examples of this concept was a Spanish town founded in 1483 by Ferdinand and Isabela on the Bay of Cadiz in Andalusia-- Puerto Real:

Its streets cross at right angles and several entire blocks are omitted to form plazas, on the largest of which front the public buildings; Ponz, three centuries after founding of Puerto Real, lauds its straight streets and sound construction. (Ponz 1947:1597 cited in Foster 1960:44)

Although this Spanish Puerto Real (as opposed to the one on Hispaniola) was founded in 1483, it is Santa Fe de Granada founded by Ferdinand and Isabela in 1491 on the outskirts of the beseiged Moorish kingdom of Granada that is generally credited as being the "first" such Spanish grid town. Starting out as a military encampment from where the final assault of the Reconquista was launched, carpenters and masons were brought in to make it a permanent city marking the final conquest of the Moors (Foster 1960:44).

The grid-town plan generally is manifested by streets radiating from a square or oblong central plaza,

intersecting at right angles and forming neat, orderly, rectangular blocks of defined living space. Facing the open plaza (in which much of the town's commercial life takes place) are the important town structures: a church, government buildings, major businesses, and homes of important political and religious leaders. It is a formalized microcosm of the ideal Spanish society. In contrast, Old World Spanish towns established prior to ca. 1450 generally present a rather formless appearance (Foster 1960:14).

Perhaps the most intriguing aspect of the grid-town plan and its relationship to the concept of empire is that its New World manifestation was not a new idea. It had antecedents in both Greek and Roman practices. What is interesting is not necessarily that this ordering developed as a cultural ideal but the timing in which it physically manifested its existence: in all three cases, only after the expansion of empire had begun. As Foster (1960:49) observes:

In a sense Spanish city planning in the New World recapitulates earlier Greek and Roman patterns. Greece and Rome, already built up when the grid-and-forum pattern evolved, built their most perfectly aligned cities in their provinces and overseas colonies. By the time the Spaniards had worked out their ideal grid-and-plaza town most of their cities had been built or rebuilt, and only in the New World was it possible to execute the beautifully symmetrical plans so dear to the Spanish bureaucrat of the time.

The exact entrance date of the grid-plan town to the New World is not known; however, Ovando is credited with

laying out Santo Domingo in essentially this fashion in 1502 (Palm 1951:241). Individual expression or development of regional diversities must not be negated in stressing these major aspects of the Spanish unity of ideal imposed on the New World experience. Both did occur, as is evident by the rich diversity of present Latin American cultures; however, it is the similarity of all Latin American cultures, not their differences, over such a broad expanse of varied geographical settings that is striking testimony to the effectiveness of the unified imperial presence of 16th-century Spain. It was at Puerto Real (1503-1578) and Nicolas Ovando's other fourteen perimeter-located exploitative towns on the island of Hispaniola (all begun in 1502-1504) that this formalization of structure and subsequent adjustment to the New World environment began.

The traditional Iberian patterns of conquest activity were implemented in their basic form in the Antilles, primarily on Hispaniola and at such towns as Puerto Real. There these traditional forms of behavior were first subjected to and changed by contact with an alien culture. It was the Spaniards' ability to adapt to these changes, while still maintaining order and cohesiveness in their own culture, which allowed their final conquest of the New World and its native populations, first the Antilles then Tierra Firme.

Setting of Empire

It is necessary to review the major political, economic, and religious forces in Spain in the late-15th

through 16th centuries in order to understand Puerto Real and the earliest phase of Spanish conquest and settlement in the New World. Only through consideration of such processes can one assimilate the underlying reasons that caused one of Spain's first and more economically sound colonies to grow, blossom, and wither in a span of seventy-five years (1503-1578).

Viewed in terms of global history, the discovery and effective exploitation of the New World was a product of the European Renaissance which coalesced the themes of scientific enquiry, the machinations of power, the realization of self in works, the consciousness of the individual and the sense of unity of history (Lerner 1966: 63-64). That Spain should be directly involved in carrying out the Renaissance "quest" is in part attributable to the unique geophysical position of the Iberian peninsula, which lies at the crossroads of all major seaborne trade routes between Europe, the Mediterranean, Africa, and the Near East. Its unique location allowed the Iberian peninsula access to the entire spectrum of known intellectual wealth as well as the material commodities that passed through its ports from the rest of Europe, Africa, and the East.

Prior to and during the reign of Ferdinand and Isabela, Spanish students regularly were educated in Venice and Genoa. In addition, scholars from these renaissance nuclei of learning were imported to educate

the aristocracy in Spain itself. Venice especially provided the cultural role model of renaissance development that Spain was in great measure to adopt (McNeill 1974: 155):

And just as the cloth trade migrated from the mainland to Venice to escape the wars and accompanying disorders, so also Venice assumed leadership or had it thrust upon her in the further development of renaissance art, music, theater, not to mention the art of printing. Moreover, the University of Padua, since 1405 the only institution of higher learning in the Venetian domain, became the seat of a distinguished school of philosophy and, in sixteenth and early seventeenth centuries, led the entire world in the development of medical and related sciences.

Perhaps the most famous of these foreign "Spaniards" was that of the Genoese--Christopher Columbus--the foreigner who "gave" Spain the New World. "Gave" is a poor choice of words, for Columbus attempted his venture only after formalizing a very attractive contract with the Spanish crown concerning rights and rewards of discovery. In that document he requested for himself and his descendents the post of governor-general and viceroy of all lands he discovered in perpetuity. In fact, his demands were so high that King D. Joao II of Portugal had refused his offer in 1484 (Morison 1940:43). Scholars and seafarers were not the only foreign imports to Spain in the 14th, 15th, and 16th centuries: large numbers of skilled craftsmen, artisans, and merchants also arrived.

One of the most successful segments of Spanish society during this period was that of the Jewish people.

Their success in part led Spain to impose the courts of the Inquisition in 1478. This inquisition was done primarily to purge society of the heretical conversos (Jewish people who had renounced Judaism and been converted to Christianity in order to live more freely in Spanish society). Many of these conversos had converted in name only and still practiced Judaic rites, considered an act of heresy by the Inquisition and in gravest extremes punishable by burning at the stake.

The last phase of the Reconquista, or recapture of Spain from the Moors, was taking place during this same period. Once the final conquest of the Moors was completed in the kingdom of Granada in 1492, Ferdinand and Isabela, in an effort to completely purify the religious state of Spain, ordered all Jewish people to leave the country within four months.

The combined efforts of Inquisition and expulsion of the Jewish people resulted in the loss to Spain of approximately 150,000 of its most industrious and managerially skilled segments of population. The majority of these Jewish people resettled in Moslem-controlled lands which were the economic and political enemies of Spain. This same pattern was followed in 1502 after the Morisco revolt in Granada resulted in 300,000 Moslems being expelled. Thus, at the eve of the 16th century Spain's attempts to purify her faith resulted in weakening her economy (Vicens Vives 1969:291-292) and

deflating her population by 500,000 members, a population already weakened by the ravage of the Black Death.

This void was filled by foreign immigrants, most notably Italian merchants and artisans. One ironical aspect of this demographic shift is that many Jewish merchants who fled Spain in 1492 went to reside in Italy, in effect replacing the Christian Venetian merchant sector that emigrated to Spain to take their place (McNeill 1974:149). In addition, French shepherds and farmers moved into Catalonia to take over fallow lands and deserted homesteads. Apparently the population void in Catalonia was even more pronounced than in other areas of Spain. The Black Death (plague) had earlier killed off a tenth of the rural population there (Vicens Vives 1969:182-183).

During this period the decline of the once powerful Venetian and Genoan trading and shipping empires occurred, in part as a result of the Iberian peninsula's development (both Spain and Portugal) as a formidable naval power. Material and intellectual wealth of these renaissance centers of trade, learning, and the arts was dispersed (Elliott 1963:125). Spain, with room for immigrants, capitalized on the demise of the Italian centers and provided a new economic frontier for ambitious and skilled Venetian and Genoese mercantilists (Vicens Vives 1969:181).

Ferdinand and Isabela established the consolidation of power under their crown during this time period through

control of the two most important segments of late medieval Iberian society--the aristocracy and the church.

The aristocracy was controlled through the monopolistic support the crown provided the wool trade above all other forms of economic activity (Elliott 1963: 116,117). The church was controlled through papal support granted Ferdinand and Isabela (now known as the "Catholic Kings") for their successful completion of the Reconquista of the Moslems, the Inquisition of heretics, the expulsion of the Jewish people and Moriscos, and the discovery of a vast new field of souls and tithes to be won under the Spanish flag in the New World (Elliott 1963:97-103).

In addition to the New World's wealth of souls, there was also the tremendous wealth of gold, silver, and pearls. The sudden influx of these goods during the 16th century reinforced the Crown's hold on the Iberian economy and its control of the aristocracy. The machinery of empire could develop through sacred and secular power now concentrated in and coordinated by one crown.

Spain had also been perfecting its land-based military machine while adjusting its social and economic structure for efficient warfare and conquest. The centuries-old battle to reconquer Iberia from the Moors provided stimulus for these actions which produced the military impetus and experienced personnel needed to conquer a new world.

The Spanish emphasis on the mesta--wool production, sheep herding, and trade--tended to form a symbiotic relationship with the needs of warfare for several reasons: 1) it provided a high profit and visible return on investment for the small number of aristocracy controlling the herds and trading systems; 2) this concentrated wealth became directly accessible to the crown, which needed to finance its efforts at reconquest; and, 3) it was a non-labor intensive industry which left large numbers of males free to be used in military activity (Vicens Vives 1969:349).

This process had important effects on the Spanish social structure. It engendered the development of the institution of the hidalgo or strong man, adventurer-warrior class. During the Reconquista these "military" leaders formed contracts with the crown to fight and conquer in return for a defined share of the spoils (Elliott 1963:57,62). Hidalgos were culture heroes held in esteem by the population; their priorities became the goals of the common man, a love for adventure and wealth tempered by a distaste for mundane physical labor (Elliott 1963:32). The "contract" between crown and warrior-adventurer also became the tool through which conquest became possible and often resulted in grants of large tracts of land to individuals, a system later known as latifundia (Elliott 1963:28). The concept of contract solidified the goals of the crown with those of warrior,

especially in the New World where the hidalgo became known as conquistador. The Castilian warrior attacked the New World, secure of his mission, ordained by his God and country, and propelled by his desire for material things, or as Cortes' companion Bernal Diaz del Castillo said: "We came here to serve God and the king and also to get rich" (Hanke 1951:9).

The crown granted the New World conquistador not only the exploitation of natural resources through the latifundia, but also the exploitation of human resources through the system of encomienda. This system was developed to replace the conquistadors' enslavement of the native Indians. Encomienda, a system intermediate between European feudalism and the native chiefdoms, was used to populate and provide labor for the latifundia. When land was distributed to the hidalgos a certain number of the local Indian population came along with it. This division of the Indian population was known as repartimiento; Indians were "commended" to the care of the person holding the land grant (encomendero).

Theoretically encomienda was based on principles which could not have been more humane: the grantee agreed to Christianize the Indian and not to treat him as a vassal; he further agreed to respect the Indian's personal property and not to consider him chattel or subject him to personal abuse. (Vicens Vives 1969:320)

However, theory very seldom coincided with practice and the Indians were so consistently abused that both the crown (in its New Laws of 1542 which limited the scope of

encomienda) and the church (led by Bartolomé de las Casas) were embroiled in conflict with colonists trying to limit these abuses.

The New World offered an expanding horizon for the Spanish warrior class which had developed during the Reconquista. Timing of the discovery of the New World allowed Spain to begin its exploration and settlement with a seasoned, disciplined class of warriors. Not only did the New World provide a new scene for adventure for the hidalgo, but once the mainland was conquered it also provided free human labor and copious rewards of material wealth.

The material rewards to the hidalgo were few prior to the discovery of vast accumulated Indian wealth on Tierra Firme. Likewise, returns to the Spanish investors had been relatively unspectacular during the time of the Antilles' discovery and exploitation. In fact, it was the new discovery of "easy wealth" on the mainland that precipitated an effective depopulation of many Antillean settlements such as Puerto Real in the 1520s and 1530s (Vicens Vives 1969:317). The majority of adventuresome Spaniards who had spearheaded the initial conquest of the Antilles in search of quick wealth and valor had little reason to stay on these islands after their foes had been vanquished and all easily exploitable wealth removed. The only monetary profits left to be made were intertwined with agricultural endeavors requiring physical

work and a long term effort which produced consistent but small profits compared to temples covered with gold.

Unfortunately for the Spanish, the discovery and exploitation of the New World by Spain did not occur in a vacuum. There existed other European powers envious of this new-found wealth: Portugal, France, England, and the Netherlands. Although scholars may continue to argue whether or not Columbus "discovered" the New World, there is no doubt that his voyages opened that region to the rest of Europe.

After the military defeat of the Spanish Armada in 1588 and its economic repercussion, the continued funding of expansion and consolidation of imperial designs became increasingly difficult even with the continued influx of New World bullion. Privateering, foreign attacks, rescate, and legal competitive inroads from foreign nations so weakened this Spanish "monopoly" that in 1619 Sancho de Moncada complained that nine-tenths of all trade in the Indies was carried on by foreigners (Vicens Vives 1969: 433). The accuracy of Moncada's complaint foretold the demise of the Spanish New World empire.

Empire and Puerto Real

Although for Spain its New World empire ended on the falling notes of decline, debt, and despair, the empire began on the rising notes of expansion, energy, and optimism. This optimism was epitomized by Ovando's

systematic, imperially backed plan for Hispaniola's exploitation. Puerto Real was founded in the early 16th century (1503) and was part of this first successful, competently administered plan of colonization in the New World by Spain.

Navidad, an earlier settlement in the vicinity of Puerto Real, was founded through necessity as a result of the wreck of the Santa Maria (Sauer 1969:33). It lasted only a few months to a year. Isabela, also founded earlier, was quickly conceived, poorly placed, and more poorly administered (Sauer 1969:74,83). It was only with the abandonment of Isabela, the establishment of Santo Domingo, the ouster of Columbus, and the subsequent takeover by Nicolas Ovando that Hispaniola came to be a part of the Spanish empire's ordered exploitation. To carry out this systematic colonization and exploitation Ovando ordered the establishment of fifteen towns around the perimeter of the island (Sauer 1969:151). Puerto Real was one of the towns(Figure 1).

Several economic endeavors played a role in the establishment of Puerto Real, including the possibility of gold and copper mining in the nearby mountains, Indian slave trade, the presence of cassava (a native root crop used in bread), and the developing trade in cattle hides.

Of these endeavors, the gold and copper mining were the least important to the maintenance of the town and the

first to be abandoned. Las Casas (1971:149) described the copper mining efforts:

At that time they found copper in a sierra near Puerto Real which was said to contain a large proportion of gold detectable from the outside. The comendador sent an expert who certified it and so overrated it that the comendador wrote the King to recommend extensive development of this resource. The King hoped this would bring Spain an affluence of wealth and, since the comendador had asked for officials and costly instruments, they began to dig sierras and strip mountains under the direction of that expert. But the expenses, labor, and pain suffered by the Indians came to so little copper it barely covered the cost and the comendador was greatly embarrassed, given his customary prudence and authoritativeness, to have to inform the King and risk his displeasure.

It is probably in reference to the trace gold deposits mentioned above by Las Casas that Sauer is referring to in his statement, "Except for the original Cotui, a district high in the mountains to the southwest of Bonao, and a little activity behind Puerto Real, there was negligible discovery of new gold-bearing areas" (1969:154-155). It seems likely that the mining of copper or gold, initially an attractive enterprise, never played a major role in the development of Puerto Real.

Perhaps the second most attractive economic activity after mining (at least to the hidalgo) was the Indian slave trade. Slave trading provided quick, high profits with a low overhead. "The two northern ports of Puerto Plata and Puerto Real were the landing places for slaving expeditions against the Indians of the Lucayos (Bahamas) between 1508-1512. During those years some

40,000 Indian slaves were unloaded in these two ports" (Hodges 1979:3).

Although Puerto Real's middle-man position in the Lucayan Indian slave trade was undoubtedly profitable, the Lucayan Indians were a rapidly depleted resource. This wholesale enslavement and export of Indians from the Bahamas took the Spanish less than five years to accomplish. The major traffic in these Indians occurred from 1509 to 1512; by 1513 the aborigines were eradicated (Sauer 1969: 160). During the course of this exploitation their price went from 5 to 150 gold pesos an individual (Sauer 1969: 160).

The economic mainstay at Puerto Real was provided by cassava and cattle production. Native cassava and other edible foodstuffs were cultivated first to sustain life at the colony (Lyon 1981:2). Cassava became the first agricultural product to be cultivated in the New World for export in addition to supplying colonial diets with a staple foodstuff. Its agreeable taste and ability to store well under hot humid conditions made it a popular ship's fare, loaded on in Hispaniola to replenish exhausted ship's stores (Sauer 1969:95). Cattle production, although requiring several years to establish itself due to the breeding cycle and limitations of species, was also important, and the animals apparently came to thrive in their new environment. It was the town's location on a

fertile grassy plain, the lack of predatory land carnivores, a favorable climate, a large pool of Indian labor at a major early 16th century transportation crossroads, and a hide-starved European market which assured Puerto Real's place as a major New World hide production center. "Over the life of Puerto Real, many ships came and went from Spain and the Canary islands; some were owned by, manned by, or carried cargos for merchants who were citizens of the town. And the most important cargo they carried out was that of hides" (Lyon 1981:2).

An economy based on the production of hides from semi-wild cattle required large landholdings. Such holdings fell directly in line with the hidalgo's familiarity with the Old World practice of latifundia. Puerto Real, therefore, can be seen as an excellent example of a major Iberian cultural economic practice being transmitted to the New World.

The economic importance of these hides is contained in this description of their market potential in Europe:

With the discovery of America came the famous Indies hides, the finishing of which gave new impetus to the medieval industry. American hides successfully took the place of those which formerly had come from the East, by now reduced to a few bundles bought by the Catalans not in their ports of origin but through intermediaries in Genoa and Marseilles. The most prized products of this industry were the Guadamecies, of leather embossed and decorated with pictures and drawings and used for ornamental purposes. Leather jackets were also worn and, very particularly gloves from Ocana and Ciudad Real were sold perfumed with ambergris in the main European markets, especially Italian ones. (Vicens Vives 1969:353)

The geophysical position of Puerto Real as described in Chapter III was also important, for from it the Spaniards controlled the natural crossroads of all known modes of transportation: 1) riverine, allowing easy exploration and exploitation of the interior; 2) terrestrial traffic along the flat Vega Real; and, 3) maritime traffic (coastal and ocean-going, with favorable winds and currents flowing into the Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea). Location of a port town inland along a river instead of in an easily accessible harbor was a common 16th century practice in Spain where major ports were located on rivers to make them less vulnerable to the sea's fury as well as pirate attack. Cities such as Seville and Bilbao serve as examples (Vicens Vives 1969:364). A riverside location for Puerto Real also offered fresh drinking water and a supply of xerophytic hardwoods along the banks of the Fossé for fire and construction. The town's closeness to the ocean shore provided a continual breeze which helped alleviate insect pests such as mosquito and sand flea.

Although its geophysical location initially was its major asset, it was soon to become Puerto Real's major liability. As the 16th century progressed and the Spanish fleet system of trade with the New World developed to provide security for the merchant vessels, Puerto Real was bypassed by the new fleet route which went along the southern coast of Hispaniola with its major port at Santo

Domingo. This new route meant either shipment of hides from Puerto Real by mule or ox teams inland across the island, a very expensive proposition vocally opposed by residents of Puerto Real (Lyon 1981:4), or shipment by sea against prevailing winds and currents.

Neither of these routes was economically sound. It was only logical that the other European powers then attempting to exploit the New World would fill the logistical void in response to this situation and begin trade with Puerto Real. The military risk factor was minimal since Spain's main interests and military hardware were concentrated at Santo Domingo on the opposite side of the island from Puerto Real, both downwind and upcurrent. The result was the beginning of a rather extensive and lucrative system called rescate. Rescate was the illegal trade of colonial goods, in this case hides, with non-Spanish entities: the French around 1533, the English 1560, and finally the Dutch (Lyon 1981:1).

After an initial decade or two of growth, Puerto Real became a victim of the Antillean-wide depopulation which followed Cortes' triumph in Mexico. The discovery of vast amounts of gold on the mainland in 1520 led many Spaniards to move farther west. Las Casas (1951:241) observed in 1555 that the town still existed but was "half abandoned." Desertion did not mean that the town was no longer economically viable. Instead, it reflected the demographic and land-use patterns which predominated the economic life of the town, the system of latifundia. Cattle

raising and skinning was a non-labor-intensive industry, like sheep herding and the mesta in Old Spain. Relatively few Spaniards were needed to coordinate activities and reap the profits of a latifundia system using first Indian then Negro slaves. The economic viability of Puerto Real was little harmed by the exodus of an excess Spanish population disdainful of manual labor and eager for easy wealth and glory.

At mid-16th century the colony of Puerto Real was still viable but the hide trade profits were not shared in an acceptable amount with the Spanish crown or Catholic Church. The profits fell mainly to the few controlling vecinos at Puerto Real and to France, England, and the Netherlands, all centers of the Reformation and political/economic enemies of Spain. Not only did Spain lose its direct profit from resale and processing of the cattle hides, it also lost Puerto Real as a market for Spanish-produced goods since similar goods were being supplied by other European countries.

American trade consisted in taking high-priced consumer products to America and bringing back cheap money. The idea that the Indies constituted a national patrimony and that their economy should merely be complementary to that of the mother country was strengthened by the presence of American treasures. . . . The mistake . . . was the belief that the Indies was a true monopoly market, when in reality contraband and illicit trade made such an economic situation in America impossible. (Vicens Vives 1969:401)

As the 16th century wore on, Puerto Real became less of an asset to the Spanish empire and more of an asset to Spain's political, economic, and

religious enemies. Although Cortes' conquest of Mexico filled Spanish coffers with bullion, it also required greater expenditures to protect Spain's interest in the New World, now under greater attack. This continual New World drain, in addition to a major collapse of the mesta from inflated costs of wool production in the late 1550s led Spain to bankruptcy in 1557 (Elliott 1963:197). This poor state of economic affairs weighed heavily in Charles V's decision to abdicate the throne to his son Phillip II in 1556.

Spain increased the average size of its trading vessels from one-hundred tons to three-hundred tons in an attempt to economize on military protection and shipping expenditures in the face of financial disaster and increased privateering (Vicens Vives 1969:327). In a similar mood of efficiency Spain finally centralized its governmental capital at Madrid in 1561.

Spanish expenditures kept pace with or exceeded royal income by 1568, leading to a recession in New World trade (Elliott 1963:259). A revolt by the Moors occurred in Granada, and the pirates and Protestants grew even stronger. In 1575 Spain experienced its second bankruptcy (Elliott 1963:260).

It is not surprising that Puerto Real (long since a financial and military liability) was dissolved in 1578 along with nearby Montecristi. The two resident

populations were centralized at the more easily defended location of Bayaha on the shore of present Ft. Liberté Bay in northeast Haiti (Hamilton and Hodges 1982:2) (Figure 2b).

Things took a bright turn for Spain in the 1580s when new and greater wealth poured in from the New World.

The introduction of the amalgam of mercury into the refining of Peruvian silver was by now beginning to yield results, and during the second half of the 1570's there was a dramatic increase in the supplies of silver reaching the King from the New World. During the 1580's and 1590's Philip could expect to obtain some two to three million ducats a year from the treasure fleets. Trade between Seville and the New World reached new heights; the bankers, partially satisfied by the medio general or debt settlement of December 1577, began to recover confidence; and the fairs of Castile, having miraculously survived the bankruptcies of 1557 and 1575, enjoyed in the 1580's an Indian summer. (Elliott 1963:265)

The new wealth filled the Spanish coffers and made possible further expansion such as the annexation of Portugal. Unfortunately, it also resulted in the devaluation of the currency.

Spain, in an attempt to strengthen her monopoly on New World trade, established an embargo in 1585 on Dutch goods. This backfired by forcing the Dutch to even greater predation of Spanish interests through piracy and rescate in the Caribbean (Elliott 1963:287-288). Next, in Spain's most infamous naval battle, the invincible armada was sent against the English in 1588 only to be soundly defeated, crippling Spain's once proud naval capacities. Economic hardship again befell Spain as it attempted to protect its now expansive interests in both the Atlantic

and Pacific while trying to rebuild its fleet. Spain again went bankrupt in 1596 (Elliott 1963:286).

During this troubled time in 1598 Spain once again changed rulers as Phillip III succeeded Philip II. Apparently the new monarch felt that the easiest way to overcome the lack of money was to print more of it. New money was printed from 1599 to 1626 and resulted in devaluation of the currency and more inflation (Elliott 1963:300). Governor Osorio of Hispaniola ordered the depopulation of the north of Haiti (1605) during this period of economic and military instability. Thus, most of the remainder of Puerto Real's settlers living at Bayaha now moved to the south, concentrating all of Spanish efforts in Hispaniola around the main port of Santo Domingo. Not all of these settlers, however, felt inclined to blindly obey such orders from the Spanish bureaucracy, whether it was from Santo Domingo or Madrid itself.

As might have been expected, there was a great resistance on the part of the inhabitants of the Band of the North. However, to enforce the same, Osorio was able to force them to leave their houses at the end of 24 hours after proclaiming the cedulas of depopulation, and then he proceeded to ruin their huts (bohios), their ranches, the churches, the planted fields, and all that was necessary to discourage the settlers from wanting to remain in those places. . . . Thus were depopulated Puerto Plata, Montecristi, Yaguana, and Bayaha. In this last place the settlers attempted to resist the depopulation and rose in arms against Osorio and his soldiers. . . . This was a popular rebellion of the common people, the mulattos and free negros seeing the depopulation as the beginning of their ruin. (Moya Pons 1977:58-59)

In addition to those settlers who refused to "depopulate" the area, the northwest of Hispaniola now became the undisputed haven for buccaneers who had major encampments on the island of Tortuga and at Ft. Liberté Bay (Hamilton and Hodges 1982:45).

At this time Puerto Real disappears from the historical record. For nearly one-hundred seventy years no further mention of the town is found in documents. In the 18th century French authors such as Moreau and Charlevoix noted the standing ruins on the lands of the Habitation Montholon and referred to them as the "Chateau de Colon," mistakenly identifying them with Columbus and Navidad. The French colonists mined the standing ruins for building materials during the late 18th century to supply the new French colony of St. Domingue. The majority of the materials were used in construction of the nearby Habitation Destouches (Hodges 1979:1).

Puerto Real faded from records between 1780 and 1975, apparently swallowed by xerophytic thornbrush scrub and being disturbed only periodically by small-scale hoe agriculture.

The 1975 rediscovery of Puerto Real by longtime Haitian resident, physician, and historian Dr. William Hodges was an accidental by-product of his on-going search for Navidad, Columbus' first settlement in the New World. Haitian children working in their gardens brought him numerous artifacts of the early 16th century

Spanish period. Due to the sheer volume of material collected, over twenty-thousand pieces of ceramics, glass, and metal, plus the existence of several large earthen mounds at one of which were three carved stone gargoyles, Hodges knew this site represented more than just a year-long settlement of the crew of the Santa Maria at Navidad in 1492. He believed the site was the 1503 town of Puerto Real, uninhabited for over three-hundred seventy-five years and covered by Haitian tropical vegetation.

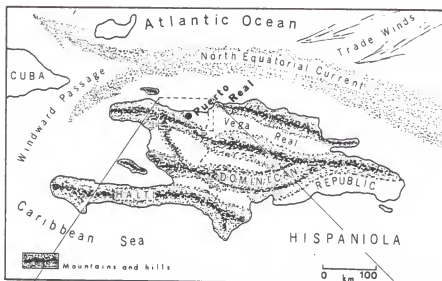
Subsequent chapters describe the site and the first archeological excavations which took place there in 1979 and 1980. The focus of the excavations was to investigate the area from which Hodges recovered the carved stone gargoyles and which appeared to be the central sector of the town.

The following chapter examines the natural setting of Puerto Real. As seen above, the geographical location of the settlement relative to natural factors was important to the history of the town.

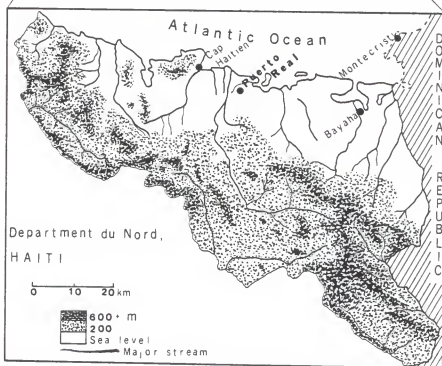
CHAPTER III NATURAL SETTING OF PUERTO REAL

Puerto Real lies at the northernmost projection of Hispaniola's Vega Real (referred to in Haiti as the Plain du Nord). The Vega Real is a narrow plain running diagonally from northwest to southeast across the island, from Haiti to the Dominican Republic. Figure 2 shows this plain which is bordered on the north and south by mountain systems. The southern system is known in Haiti as the Massif du Nord and in the Dominican Republic as the Cordillera Central. The northern system, entirely within the Dominican Republic, is called the Cordillera Septentrional. Figure 2 also portrays the topographic setting of Puerto Real within Haiti.

The location of Puerto Real--at the northern end of the Vega Real near the mouth of the Grand Riviere--was quite propitious. This location allowed easy use of the westward running Trade Winds and the North Equatorial Current just before its southerly split between Cuba and Haiti at the Windward Passage. From this point the Spaniards controlled the natural crossroads of all known modes of transportation: 1) riverine, allowing easy exploration and exploitation of the interior of the island; 2) terrestrial, along the flat Vega Real



a. General topography, wind and currents



b. Detailed topography and watershed

Figure 2. Geographic Setting of Puerto Real

traversing the island from east to west; and, 3) coastal and ocean-going maritime, with favorable winds and currents flowing into the Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea.

The town's location provided several other amenities to a harsh tropical frontier life; e.g., copious amounts of fresh drinking water plus a protected harbor and a continual offshore breeze. The breeze also helped to carry off such disease-carrying entomological pests as the malaria-transmitting mosquito and the sandflea (Culicoides fureus), carrier of a filarial worm (Mansonella ozzardi), at times parasitic to humans (Hodges 1980:43). This organism is generally considered non-pathogenic, except for a possible human allergic reaction to dead adult worms (Markell and Voge 1971:255).

Northeastern Haiti (or Department du Nord), in which Puerto Real lies, exhibits a geological foundation of folded and slightly faulted rock of various types. This foundation, combined with the activity of intense running rain water and wave action, has produced a great variety of landforms. The basic core of the area, granite and quartz diorite, was first overlain by beds of shale, then limestone. Intensive intrusions of basalt and andesite occur between the basement rock and these overlying sediments (Wood 1963:24,25).

Erosion and redeposition both by stream action and wave action have played an important role in shaping the

area's present topography. The major drainage system of the Plain du Nord is that of the Grand Riviere du Nord. This river has meandered significantly during the last four-hundred fifty years with traces of its abandoned channels quite evident in the area around Puerto Real. The river, or one of its major tributaries such as the present Fossé River, most likely was a major factor in the selection of the site for Puerto Real. On the other hand, the river's subsequent rapid silting-in and shoal development was surely a contributing factor (along with economic and political reasons) to the town's abandonment and lack of permanent resettlement. Since the 17th century the entire river bed adjacent to the town has been filled in by alluvium, shifting the Fossé several hundred meters to the west of the town site. Areas of low swamp land still mark the channel's deeper portions which lead toward the coast some two miles distant. These areas suggest the original emptying of the Grand Riviere into the Bay of Caracol (Figures 3 and 4).

The coastline near Puerto Real is that of a shallow mangrove-filled bay system growing outward as interior erosion and subsequent redeposition take place. This natural phenomenon was so dependable that it was harnessed by the French during the 18th century as they straightened and diked the Grand Riviere in a successful effort to direct this redeposition to produce large tracts of new arable land (Hodges 1980:35-38).

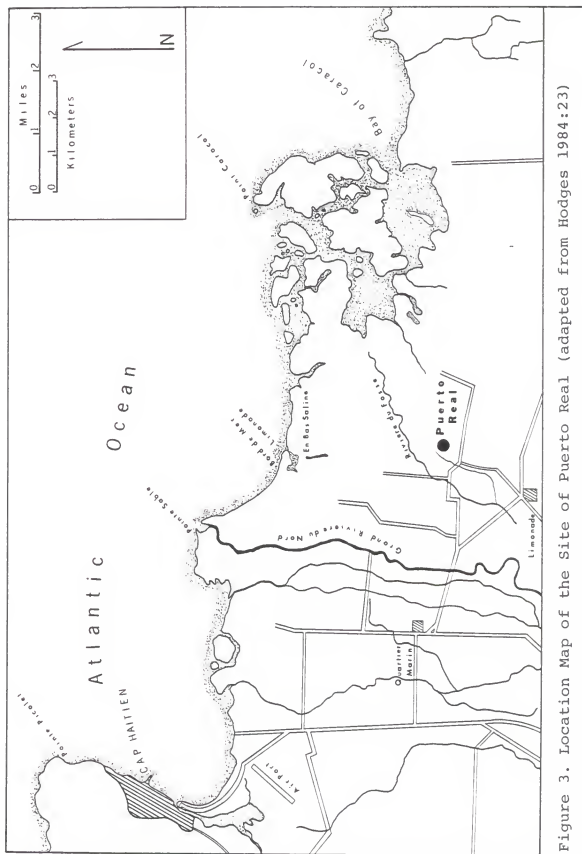


Figure 4. Natural Setting of Puerto Real

- a. Aerial view of Plain du Nord and mouth of Grand Riviere
- b. Aerial view of the mangrove and shoal system in the Bay of Caracol (adjacent to Puerto Real)
- c. Aerial view of excavation site (excavation headquarters in center of photograph)
- d. Side view of town site, looking northeast--seaward (excavation headquarters in center of photograph)
- e. Close-up of xerophytic thornbrush being cleared from the excavation site



The climate of Puerto Real is tropical in nature with mean temperature ranging from 78° F on the coast to 68° F on the nearby peaks. The mean annual temperature range for the area is less than 10° F. Rainfall varies greatly within the Department du Nord with a recorded low of 34 in and a high of 81 in. Generally due to effects of orographic lifting and moist trade wind patterns, the hills receive more rain than the plains, with heaviest rainfall on the northeastern slopes. Also, to some extent the entire Department lies within the rain-shadow of the Cordillera Septentrional to the northeast in the Dominican Republic (Wood 1963:4).

May through August are increasingly dry months, in general, with most of the rain originating from thunderstorms. September through November mark an increase in precipitation from hurricanes, thunderstorms, and a shift in the tradewinds. Precipitation drops in December to February due to a lessening in the northeast trades and an increase in cooler, drier winds from the north or "northerners." The trades switch from northeast to southeast in March, bringing an increase in thunderstorms which continue to steadily increase precipitation again until May. Thus the general annual pattern of precipitation for the area around Puerto Real is one major dry season and a rainy season that is divided by a lull in precipitation.

The soils at the site of Puerto Real consist of an "imperfectly drained clay loam" that has developed from

the heavy clay of emerged mangrove swamps. This subsoil has been thinly covered by alluvium of lighter and coarser texture producing a soil profile exhibiting two horizons. The A horizon is a 20- to 92-cm-thick surface layer of dark brown to black clay loam located immediately upon the B horizon parent material of yellow-brown silty clay (Wood 1963:58).

The natural vegetative cover of the Department du Nord has been altered considerably since 1492. It is presumed that the mountains and more humid parts of the plain were once forested with tropical, semi-deciduous, broad-leaf varieties of trees while mangroves tinged the coast and conifers proliferated on the hills of the southeast (Wood 1963:5). Drier portions of the Plain du Nord such as at the site of Puerto Real were covered with xerophytic thornbrush (Figure 4). This xerophytic cover appears to have paralleled water courses into areas of open or semi-open grassland of the Plain du Nord. Such a pattern can be seen today in areas not actively cultivated (Wood 1963:5).

Modern vegetation types near the site consist mainly of sugar cane, corn, manioc, peanuts, beans, and bananas. The sugar cane is produced by large-scale agribusiness and mechanized tilling of the soil while the other crop varieties represent home gardens worked individually by hoe and machete. The latter was being practiced at the site of Puerto Real at the time of its discovery by Dr. William Hodges in 1975 (Hodges 1979).

The greatest diversity of fauna found in this area at contact and at the present are riverine, estuarine, and deep sea aquatic species. Terrestrial forms were limited to a few types of mammals, reptiles, amphibians, and birds. These include guinea pig-like rodents (Plagiodontia aedium) and (Isolobodon portoricensis), insectivore (Solenodon paradoxus), and a large iguanid lizard (Cyclura cornuta) (Woods 1980). The present faunal assemblage of the higher vertebrates consists primarily of European domestic animals: goats, cows, donkeys, pigs, and chickens plus introduced feral species such as the mongoose.

CHAPTER IV ORGANIZATION OF THE 1979 AND 1980 EXCAVATIONS

Excavations described in this work were carried out during the summer months of 1979 and 1980 and represent the initial archeological baseline established for the long-term Puerto Real project. This project is co-sponsored by the Haitian government, the Organization of American States, and the University of Florida. Through the coordinated efforts of these institutions it is hoped that a historically accurate reconstruction of this town and interpretive museum can be established to coincide with the Quincentennial Celebration of the New World's discovery in 1992.

1979 Field Season

Thick, thorny underbrush choked the site of Building A upon our first arrival in 1979 (Figure 4e). The only apparent physical evidence of habitation was a few scattered bricks and a slight rise in topography. After clearing an 80 X 100 m area around the most centrally located rubble piles, efforts were then focused on examining a large, linear-shaped mound of rubble where Dr. Hodges recovered three carved stone gargoyles in 1975. The presence of gargoyles suggested that this building was

an important structure, either governmental or religious in function. This building was chosen for primary excavation at the site because of its central location, distinctive shape, and the presence of the gargoyles.

The 1979 season's archeological work at Puerto Real included several phases. First, the central complex of structures within the town was cleared and contour-mapped in 10 cm intervals. Second, a preliminary on-foot survey of the surrounding countryside was made to approximate the extent of the town. Third, extensive systematic test excavations were made at the site of Building A.

1979 Field Methodology

The establishment of a permanent concrete benchmark provided vertical control and tied all measurements into a grid coordinate system which provided horizontal control at the site. This was accomplished by sinking a four-foot long concrete post with the inscription P.R. 7/79, 733N 730E (Figures 8e and 8f). The grid system employed is modeled after the Universal Transverse Mercator Grid System used on all geodetic survey maps. It involves the use of coordinates given in meters north and east of an arbitrarily defined point to the south and west of the outermost projected limits of the site. In addition, this grid system can be tied in easily with SYMAP computer mapping systems. The archeological grid was angled 30° east of magnetic north to coincide as closely as possible

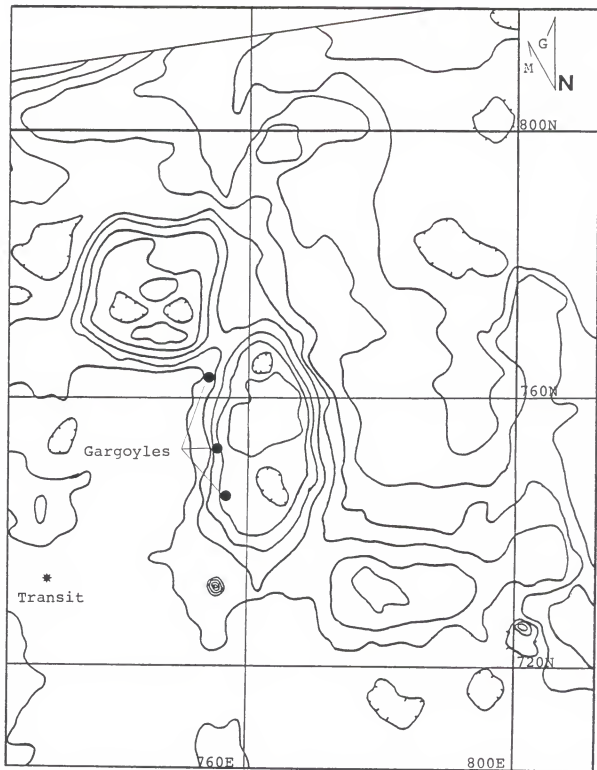


Figure 5. 1979 Puerto Real Central Sector Contour Map in 10-cm Intervals

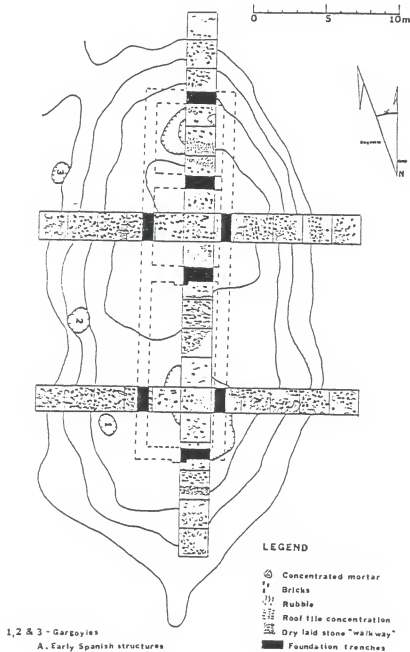


Figure 6. 1979 Excavation at Building A--Foundation Plan and Debris Pattern

Figure 7. Excavation of North-South Trench through
Building A, 1979 (viewed toward the south)



Figure 8. 1979 Benchmark Placement and 1980 Excavation Procedures

- a. Electrical resistivity mapping, Shapiro
- b. Contour mapping, Hamilton
- c. Contour mapping
- d. Burial excavation
- e. Concrete benchmark placement
- f. Concrete benchmark location
- g. Permanent transit station under construction



to the alignment of the Spanish grid-town plan as suggested from the contour map of Puerto Real. Such alignment was used to avoid confusion between archeological excavation units and structural elements within the town itself. The contour map was produced by taking transit readings on a 2 m grid over and 80 X 100 m area surrounding Building A.

The basic excavation unit used was a 2 X 2 m square. In total, thirty-nine of these units were excavated in the configuration of three 2-m-wide trenches with two trenches running east-west across Building A and one bisecting it along the north-south axis (see Figure 6 for their positioning). All excavation units were taken down with trowels by natural stratigraphy and dirt screened through 5/16 in steel mesh.

All material from the same proveniences was placed in baskets, tagged, and then washed in the field. Dissimilar artifacts were separated during washing (Figures 8a-f). Bulk materials such as bricks, mortar, and stone were examined, weighed, and placed in marked outside storage bins for future reference. The remaining artifacts such as glass, ceramics, bone, and metals were tagged, bagged, and taken to the laboratory for analysis and preservation treatments when necessary. All excavation units were mapped and photographed by stratum.

During the 1979 season Ray Willis was field director and Paul Hodges served as site manager and photographer. Approximately twenty Haitians were employed daily for

three months. The duties they performed were cook, artifact washers and pre-sorters, trowlers, shovelers, screeners, water haulers, chain man and rod man (surveying), and carpenters.

Contour Mapping

Examination of the contour map (Figure 5) illustrates the alignment of the town's grid plan which runs approximately 30° east of magnetic north as well as three major topographic discontinuities assumed to be structures. This alignment was verified by excavation of the east and west wall foundation trenches running 32° east of magnetic north (Figure 6). In addition to contour mapping the central building complex, a cursory on-foot survey of the surrounding area was made to provide some idea as to the extent of the town. From Building A, the designation given the structure where the gargoyles were found, the site appears to extend approximately 200 m north, 150 m east, 300 m south, and 300 m west.

Hamilton's transect testing in 1980 and 1981 delineates the site as 450 m north-south and 400 m east-west (Hamilton 1982:24).

1980 Field Season

Upon formal entrance of the University of Florida into the Puerto Real project in 1980, Ray Willis and Paul Hodges served their same roles as field director and site manager, respectively. Added personnel were graduate

students Jennifer Hamilton as excavation supervisor and contour mapper, Gary Shapiro as excavation supervisor and electrical resistivity mapper, and Rochelle Marrinan as cataloger and faunal collector. The tasks performed by the Haitians remained the same; however, their numbers increased to nearly forty for three months. The same system of excavation was followed in 1980 as developed in 1979. The only changes were the addition of a permanent concrete pillar transit station (Figure 8g), construction of a 40 X 4 ft plywood artifact-drying platform painted white and angled for drainage (Figure 9e), construction of a field office and catalog station, the design and construction of a portable A-frame photographic tower by Paul Hodges (Figures 9e-h), and the construction and use of portable excavation sun shades (Figure 9a).

The focal point of the 1980 season's work was an areal excavation of Building A. In addition to Building A excavations, a systematic intensive program of shallow test pits within the central building complex of Puerto Real was carried out. Concurrently University of Florida graduate student Gary Shapiro compiled a soil resistivity contour map of this same area. Dr. William Hodges conducted a 2 X 3 m test excavation of a human burial discovered during fence construction activities in 1979. Rochelle Marrinan prepared a faunal collection of contemporary Haitian vertebrates. The field season was completed by Jennifer Hamilton and Paul Hodges who cleared

Figure 9. Excavation Methodology

- a. Excavation
- b. Screening
- c. Standard artifact hand-washing
- d. Bulk architectural debris washing
- e. Artifact drying platform
- f. Bulk storage bins for architectural debris
- g. A-frame photographic platform designed by
Paul Hodges (pictured)
- h. Areal excavations showing excavation
headquarters in background



a.



b.



c.



d.



e.



f.



g.



h.

and contour mapped four more hectares of the town, defining numerous structural mounds of various sizes. In addition, Hamilton conducted a series of test pit transects across the site to define its physical limits and identify differential deposition of artifacts across the town, roughly sixteen hectares in size.

Contour Mapping and Linear Test Pit Transects

Figure 10 is a composite elevation contour map of the site of Puerto Real in 10 cm intervals. The 80 X 100 m central building complex is shaded to illustrate the intensive test-pit grid portion of the site discussed later in this report. In addition to compiling this 10-cm-interval contour map, Jennifer Hamilton (1982) delineated the areal extent of Puerto Real through a series of linear test-pit transects across the site. Figure 11 shows the dispersal of building materials across the area on a computer-generated artifact density contour SYMAP suggesting a town size of approximately 450 m north-south X 400 m east-west.

Soil Resistivity Survey

A soil resistivity survey of the "Central Building Complex" at Puerto Real, a sixteenth-century Spanish town on the north coast of Haiti, was conducted during the 1980 summer field season. Soil resistance was measured over an area of approximately one acre, with readings taken at one meter intervals. The resultant data enabled the construction of resistivity contour maps (showing areas of higher and lower resistance) that were available as fieldwork progressed. The maps enabled quite accurate prediction of subsurface feature locations, and thus were a valuable tool for the

Project Puerto Real

Topographic Survey

1979 - 1981

Elevations represent Meters Below Datum

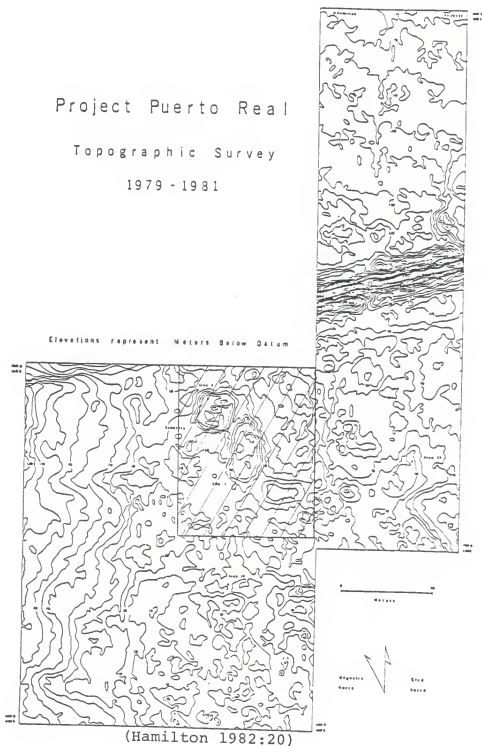


Figure 10. Topographic Contour Map in 10-cm Intervals
by Hamilton, 1980

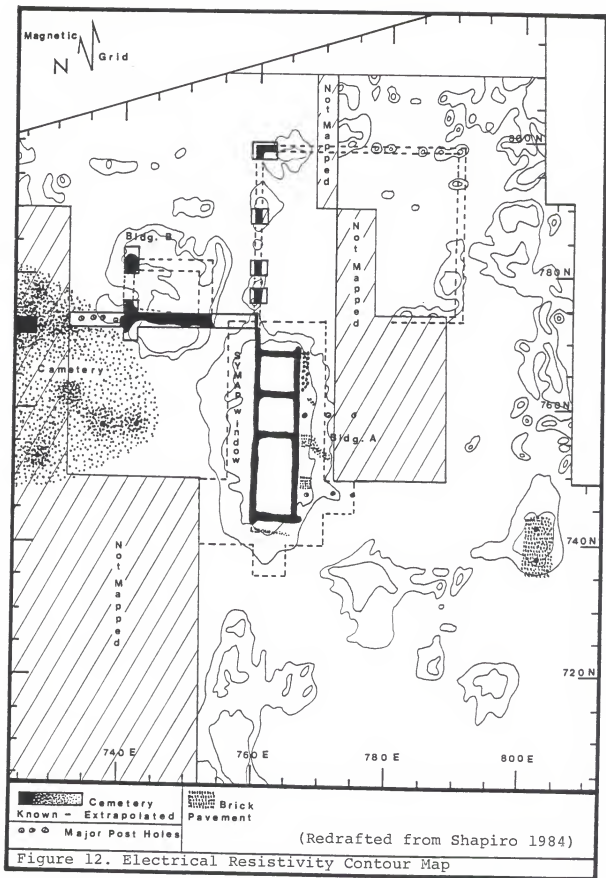
Figure 11. Building Materials Dispersal SYMAP
by Hamilton, 1980

efficient use of limited excavation time. . . . Soil resistivity has proven to be a useful technique at Puerto Real. The most important advantage gained by the use of the technique is the ability to save precious excavation time by the prediction of subsurface feature locations, and the ability to generate testable hypotheses concerning site plan. (Shapiro 1984:101,109)

Figure 12 shows Shapiro's electrical resistivity map superimposed over the composite site plan map for Puerto Real's central building complex.

Burial Test Excavation

In the course of excavations in 1980 Dr. William Hodges excavated a 2 X 3 m test at the location of the town cemetery. The exact location of a burial was found during 1979 when a worker digging post holes for a fence around the site uncovered a human cranium. Figure 12 shows the location of this excavation unit in relation to Building A and test pits with human bones. This test substantiated the presence of a formal cemetery exhibiting an extended casket or shroud burial which had been dug through at least one other similar interment. Burials were oriented at right angles to Building A with feet toward the structure and hands folded over the abdomen. The hands were probably folded over the chest at time of burial but subsided towards the abdomen as the corpse decomposed. The appearance of additional skeletal elements of at least two other individuals in the excavation unit indicates the continued use of this portion



of the site as a cemetery (Figure 8d). Areal extent of this cemetery within the central building complex will be discussed later.

Excavations have been halted until a thorough investigation of burial practices could be accomplished. Currently Dr. Hodges is preparing a more detailed report on the burial excavation.

Comparative Faunal Collections

During the 1980 season, Rochelle Marrinan collected and mascerated modern vertebrate specimens from the locality of Puerto Real. This material was deposited in the comparative zooarcheological collections of the Florida State Museum. Primarily this involved the filleting, salting, and sun-drying of fish on a wire screen rack at the site. The site manager, Paul Hodges, arranged for the purchase and butchering of a goat on the site, the meat going to the workers and bones to Marrinan.

The photograph sequence (Figures 13a-f) illustrate a unique Haitian technique of butchering which may have special implications for 16th-century Puerto Real. First the goat's neck is slit and the animal bled, the blood being collected in a small pot. Once the animal is dead, an incision through the skin is made on the lower part of one leg and a hollow cane inserted. While holding the skin tightly around the tube, air is blown into the incision while hammering the skin in front of the air bubble with a

Figure 13. Goat-Skinning Sequence at Site of Puerto Real, Haiti

- a. Slitting throat and collecting blood
- b. Foreleg incision
- c. Manual inflation of hide and separation from muscle tissue
- d. Close-up of inflation procedure
- e. Traditional skinning incisions
- f. Peeling down of loosened hide



stick, thereby loosening the skin from the muscle and fat layers. After each quarter is finished, the incision is tied off with twine and the process repeated at the next limb.

Upon completion, the goat looks similar to a grotesque balloon; however, when the traditional skinning incision down the ventral midline and ventral extremities is made, the skin can be easily peeled off the animal with no meat or fat adhering (Figure 13f). As a result, the hide processing is enormously less labor intensive since no tedious and delicate scraping is needed prior to salting, drying, and/or tanning.

When queried about this technique, the Haitians stated that it could only be used on loose-skinned animals such as goat and cow, not pigs. Paul Hodges also verified having seen a cow skinned in this manner in Limbè, twenty miles inland.

The cultural origins of the technique are unknown; however, noting the labor- and time-saving results of this practice--a cut-free, meat-free, fat-free hide ready for salting and processing--it is tempting to suggest that the process is a holdover from the Indies hide trade at 16th-century Puerto Real. It can be assumed that blacks and mulattos at Puerto Real skinned the majority of cows because of the strict status ranking of Spanish colonial society. It is historically documented that blacks and mulattos remained in the vicinity of Puerto Real and Bayaha

after the Spanish withdrawal in 1605 (Moya Pons 1977: 58,59). Cow hunting, butchering, and hide processing also continued. It would seem that some form of very efficient skinning technique would evolve or be adapted considering the number of hides produced on Hispaniola--two-hundred thousand illegal hides and twenty-thousand legal hides per year by mid-16th century (Hernandez Tapia 1970:283). Together, these factors suggest that this could be a cultural holdover from the Indies hide trade and may be a holdover from the black slaves' African heritage.

Unfortunately time did not allow a complete follow-up on the exact division of the goat's anatomical parts by the Haitian workers. However, it was interesting, both from an ethnographic and zooarcheological perspective, to note that the chief artifact washer Jean Marie got the blood and the chief excavator Ti Papa got the testicles. In Haitian, as all societies, rank apparently does have its privileges. From a faunal perspective this relative status differentiation would not be apparent in the zoo-archeological record.

CHAPTER V BUILDING A: FORM AND FUNCTION

Building A: Form

Using Figures 6, 12, and 14 as base maps for a reconstruction of Building A, it is apparent that it is a long, narrow structure of masonry construction. It possesses three main interior spaces: a major room and two smaller rooms. Attached to the northeast rear of the structure is a walled (masonry) courtyard. A dry-laid brick pavement adjoins its eastern central exterior. This paved area appears to be covered by an open-air pole structure, abutting the eastern side of Building A.

Building A is aligned 32° east of magnetic north and measures 27 m long by 7 m wide. The three interior spaces are all 7 m wide. North to south, Room 1 measures 7 m deep, Room 2 measures 6 m, and Room 3 measures 14 m. Figure 15a shows the structure's width being measured in a 1979 excavation profile.

Masonry

Foundation--The foundation for Building A is monolithic in nature, composed of a dense poured limestone/mortar mixture. Brick fragments and stone are included in the matrix of this foundation. Figure 16c shows the only

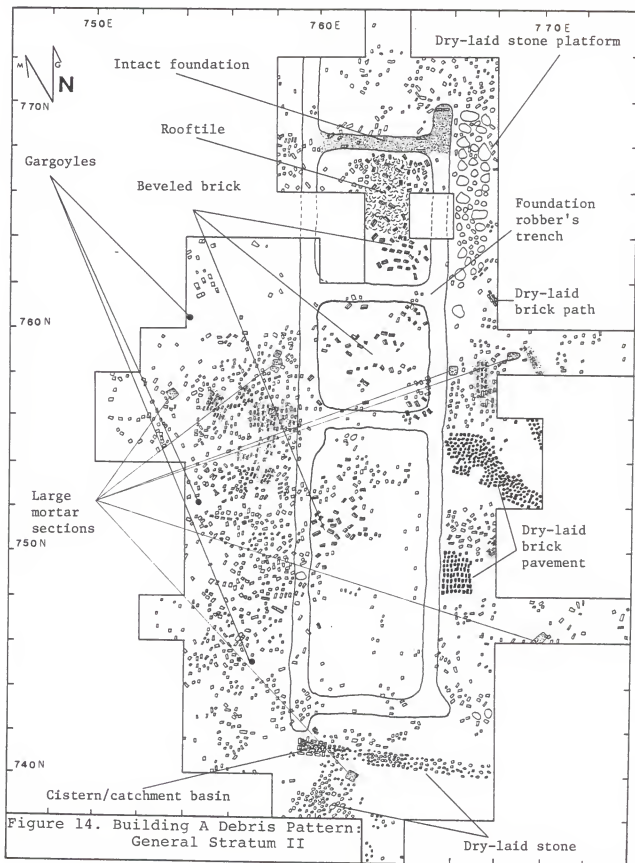


Figure 14. Building A Debris Pattern:
General Stratum II

Figure 15. Stratigraphic Profiles

- a. Measuring width of Building A between
foundation robber's trenches visible
in profile
- b. Typical stratigraphy at Building A



Figure 16. Excavation Details, East Side of Building A

- a. Typical profile of major Spanish post holes associated with the open chapel
- b. Dry-laid brick path
- c. Dry-laid stone platform and intact segment of mortar foundation
- d. Hawk's bell, in situ, located in post hole (southwest corner of open chapel)
- e. Dry-laid brick pavement (open chapel area)
- f. Dry-laid brick pavement (open chapel area)



intact portion to survive the French salvage operations in the late 18th century.

The foundation trench was dug down to the top of the B horizon clay subsoil at a width of approximately .8 to 1 m. Next the foundation mix was poured in to a depth of 40 cm. Observing the two in-place bricks on the north-east section of foundation, it appears that the first row of bricks was set while the foundation was still plastic. This is verified by the wall impression left in the foundation 2 m south and 1 m east of these bricks. These in-place bricks also provide a finished wall width of approximately 60 cm.

Walls--Exterior sections of intact wall-fall were excavated in several instances (Figures 14 and 17f). Careful examination of these features indicated no specialized pattern of brick bonding other than the generalized alternation of stretchers and headers (bricks on one row laid at right angles to the preceeding row). The mortar joints appeared from one-half as thick as the bricks themselves to the same thickness. Figure 18 shows the brick types excavated from Building A. The general construction bricks varied in length from 20 to 40 cm; however, their width was fairly consistent around 15 cm and thickness around 5 cm. Complete excavation of some smaller isolated segments of intact wall-fall suggest an exterior covering of the structure composed of a grainy

Figure 17. Excavation Details, Building A

- a. Close-up of circular window arch configuration, south end of Building A
- b. Rooftile concentration in north end of Building A
- c. Beveled brick configuration, interior of Building A
- d. Stone-lined brick cistern, south end of Building A
- e. Squatter-occupant hearth areas within large southern room, Building A
- f. Intact wall-fall, mid-structure on the west side of Building A



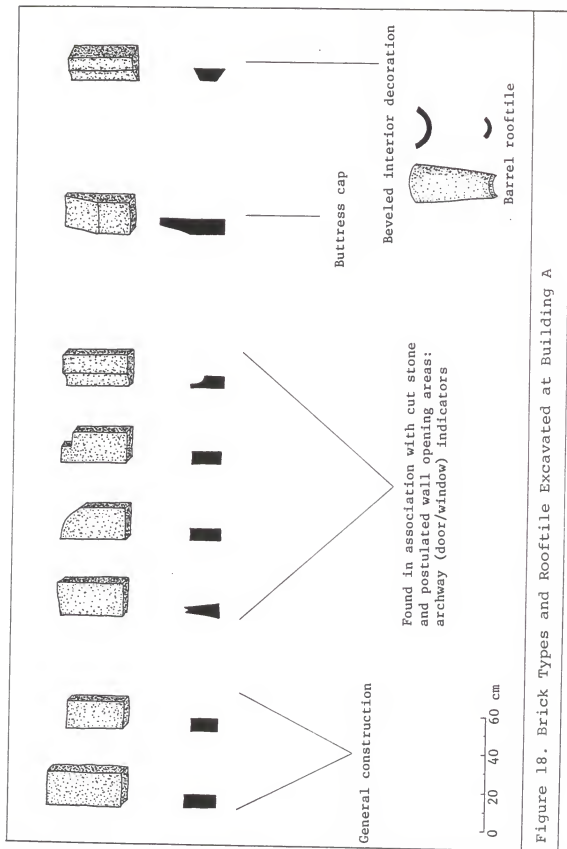


Figure 18. Brick Types and Rooftile Excavated at Building A

yellowish mortar (similar to that used in bonding the bricks) plastered 2 to 4 cm thick on its surface.

Measurements taken from the foundation trench to the top of these wall-falls indicate a maximum height of 6.5 m (Figure 14). Another interesting feature associated with these intact wall sections is that several large, thick, rectangular- or square-shaped fragments of mortar were found near the end of these wall-falls (Figure 14). At first these blocks were thought to be fragments of foundation thrown out of the footing trench by the French during their demolition process. However, comparison of this material with that of the intact foundation showed two different compositions. The intact foundation is a quite hard and strong material while these blocks are weaker and easily scored. These differences combined with their location away from the foundation and near the wall's top suggests that their function was that of a decorative, wall-top crenelation (castellated) motif.

During analysis of architectural debris, a computer-generated SYMAP was produced of mortar from the Building A 1979 excavation trenches (for all four strata; Figure 37a). It is apparent that mortar was twice as concentrated in the northern third of the structure, Rooms 1 and 2. (The highest concentrations were in the north, all at 252 kg, while the highest concentrations in the southern end were 146 kg and 137 kg.)

Because twice the amount of mortar was present (implying twice the number of bricks), it is suggested that this portion of the structure was about twice the height of the southern portion. Mortar is probably a better measure of height than brick, since the brick had been subjected to known salvage operations. Although the bricks would have been removed, the attached mortar would have remained because it was cleaned off the brick during salvage.

For a masonry structure of this time period with these dimensions and materials, the need for structural support of the walls was most likely accomplished through the use of exterior buttressing (Kubler 1948:267,268). Figure 14 shows foundation irregularities which suggest buttress placement at each corner of the structure. Centrally located buttresses were probably used for reinforcement. Excavation was not taken deep enough at these locations to uncover evidence of the central buttresses because of a desire to leave in-place intact portions of both brick pavement and intact wall-fall areas for eventual architectural reconstruction.

However, at the top (western-most) portion of the wall-fall pictured in Figure 17f and located mid-way in the building's length several bricks of a type found only at this location were found (Figure 18). Their location near the top of the wall at a position where a buttress should be suggests they capped the top of a buttress. The long

tapered surface would slope downward, shedding rain off the buttress mortar joints rather than allowing it to seep in and weaken the structure's integrity. Downward tapering exterior buttresses of similar configuration are reported by Kubler in his study of Mexican architecture of the 16th century (1948:232, plate 140, plate 159).

Figure 41a shows an 18th-century masonry Catholic church at nearby Bord de Mer Liminade exhibiting buttressing of this type. One complete Building A brick was excavated that possessed a distinct etched pattern (Figure 19). Medieval Spanish script specialist Bruce Chappell (University of Florida Library) tentatively identified this as a lot-shipment mark assigned by the Casa de Contratación or the brickmaker and indicates that the brick was made in Spain for shipment to the Indies.

Cut stone. The exterior walls of Building A also possessed rather elaborate decorative cut stone. The presence of these cut stone, in the form of three gargoyles (Figures 20, 21, and 22) originally suggested this structure for excavation. The three gargoyles were retrieved by Dr. William Hodges in 1975. Their locations are recorded on the excavation map, Figure 14. All three were located on the west side of Building A, the northernmost being a functional fluted spout, the central one a decorative element only (water channel blocked), and the southernmost one also being a functional fluted water spout.

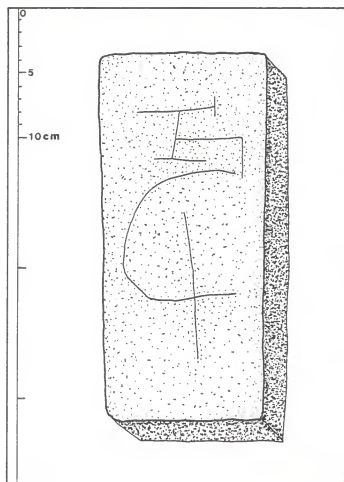


Figure 19. Etched Script Pattern on Brick from Building A

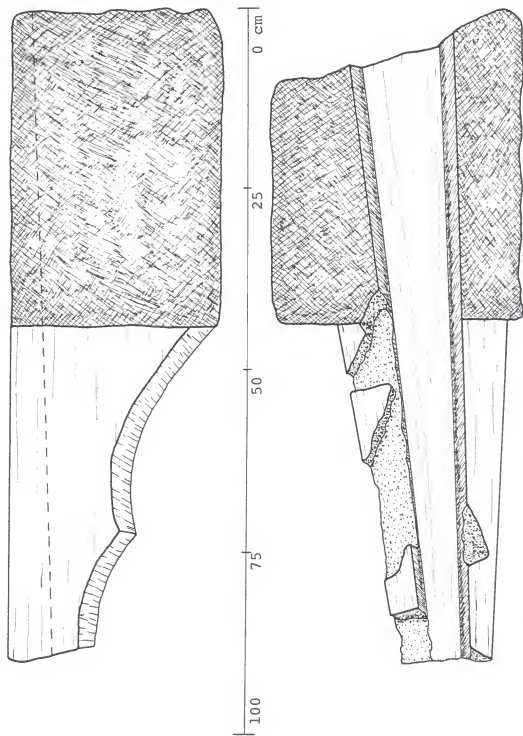


Figure 20. North Gargoyle, Building A

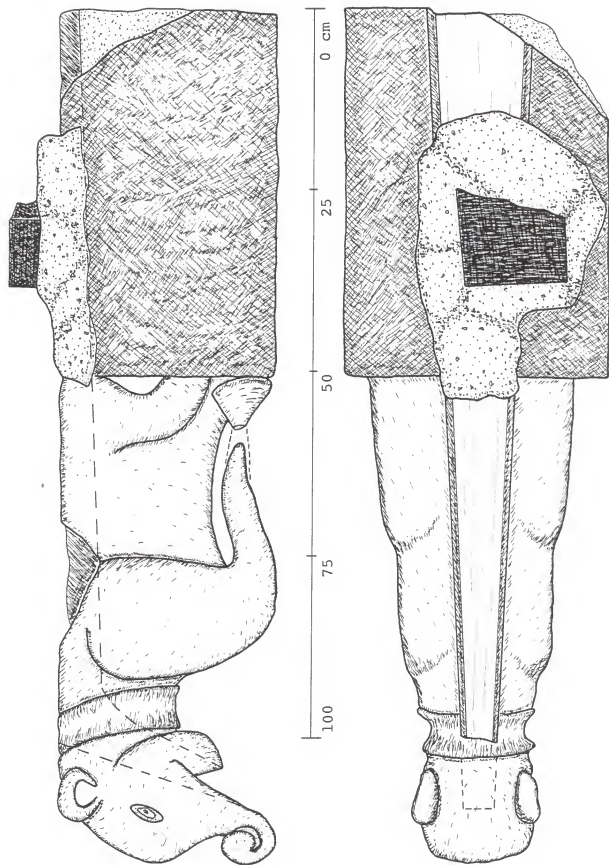


Figure 21. Central Gargoyle, Building A

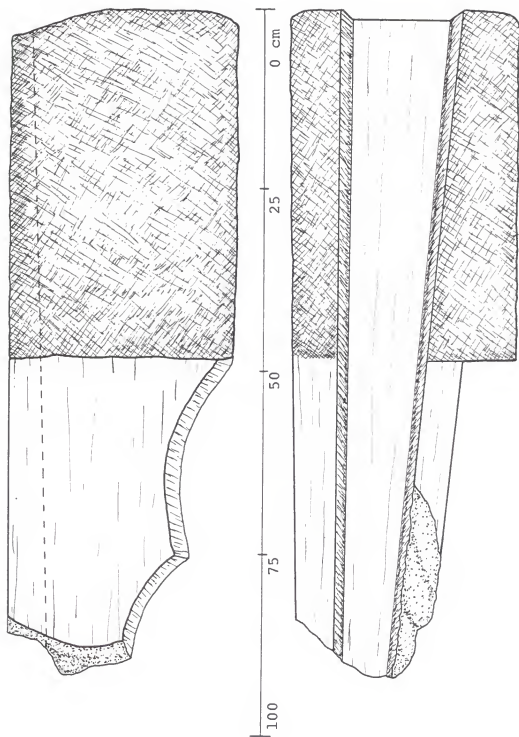


Figure 22. South Gargoyle, Building A

One broken stone pillar and the remains of three stone capitals/bases (a capital rests atop a pillar, a base rests below) were also recovered. Figures 23a,b,d, and e show the pillar and intact capital. Of interest are the stone cutter's template and tooling marks used in hewing a constant diameter on both the pillar and capital. The presence of three capital/base pieces suggests that originally paired pillars rather than a solitary configuration were present. The origin of these cut stone pieces is not known.

Wall openings. There are basically three lines of approach in attempting to reconstruct wall openings (door or window) for a razed masonry structure such as Building A:

- 1) plot the location of all material architectural elements that would indicate an opening, such as archway bricks (Figure 24a) and metal hardware for door/window construction (Figure 24b);
- 2) plot the artifact debris patterns in relation to the structure since concentrations should occur adjacent to openings in the walls; and,
- 3) compare these distributions to similarly dated structures and architectural styles.

In Figure 24, masonry indicators such as cut stone and archway bricks are plotted on Building A showing localized concentrations. Next, metal indicators are plotted, again showing localized concentrations. This yields several door positionings along with a predicted patterning of artifactual debris (Figure 24c). When this

Figure 23. Cut Stone, Building A

- a. Excavation of capital
- b. Column section in situ
- c. Composite animal-form gargoyle
- d. Side view of capital
- e. Top of capital showing stone-cutter's marks



a.



b.



c.



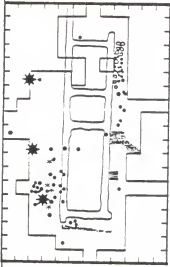
3

2

1

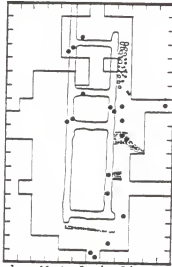
e.





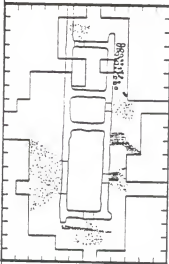
a. Masonry indicators

* Gargoyle
 • Cut stone
 * Column & capitals
 • Archway bricks
 All units
 All strata

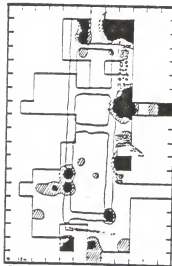


b. Metal indicators

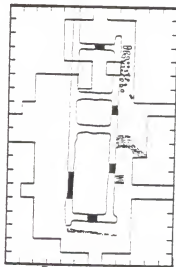
• Iron door/window hardware
 All units
 All strata



c. Postulated openings and debris pattern



d. Postulated openings adjusted to exterior artifact concentrations



e. Doorways indicated in black

Figure 24. Doorway Analysis, Building A

patterning is superimposed over the map of primary artifact deposition for Stratum III at Building A, the result is a good fit (Figure 24d). When necessary, door positions are adjusted slightly to fit the debris pattern since the masonry or metal indicators could have shifted during the structure's collapse.

Windows are a bit more problematic; however, there is some indication of a minor opening or openings on the west side of Rooms 1 and 2. Of special note is an intact portion of a small-radius arch configuration at the south end of the structure (Figure 17a). This configuration is interpreted as part of a small circular window centered over the structure's southern entrance, a common architectural device of the period which has been illustrated profusely by Kubler (1948) and Baird (1962) and is pictured on the 1508 Morales map of Hispaniola (Figure 25) which shows a stylistically similar structure placed at the location of Puerto Real (Sauer 1969:42). After masonry construction at Building A, the next most important building material to be used in reconstructing the building is wood from the associated frame. Since no wood has survived, the extensive collection of hand-wrought iron nails excavated will be used to interpret the frame of Building A.



Figure 25. Enlargement of 1508 Morales Map (Bologna copy, 1516) Showing Architectural Details of a Masonry Structure at Location of Puerto Real

Slag. Note should be made of a slag-like material recovered from Building A excavations, primarily from Stratum II construction rubble. The material appears in glassy or burned-dry randomly shaped globular configurations no larger than a closed fist. Marrinan recovered the same material (mainly from the foundation robber's trench) at adjacent Building B. She states no function for this material (Marrinan 1983:33,35). Elemental analysis of this material shows "the material is a glassy slag of low iron and calcium content, with sand inclusions. It is not the residue of a copper smelting operation while the calcium content is a point against it coming from a quicklime operation" (Mauer 1982:1). Whatever process this slag is the result of, it appears that its use at Building A was as a secondary building construction element. Examination of several intact mortar joints showed this material embedded as a spacer between bricks. Such use made possible the thick mortar joints as described earlier, allowing the bricks to be set without sinking down out-of-level.

Wood Frame Nails

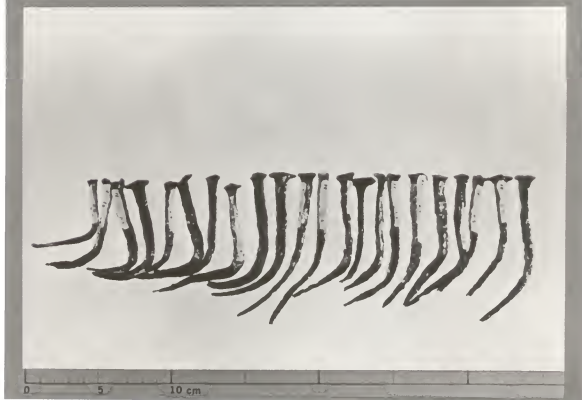
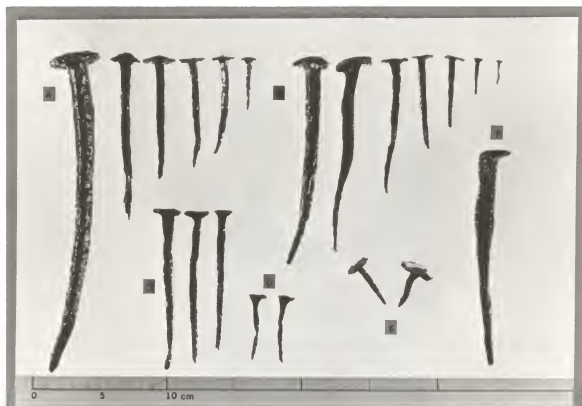
Preservation of iron nails at Building A was surprisingly good, nine-hundred sixty-four nail or nail fragments were recovered, all hand-wrought. Of this material a random sample was drawn consisting of all (two-hundred fifty-seven) whole nails (head-shank-tip). These nails were then manually cleaned, placed under electrolysis for several months, de-salted, dried, and coated with two coats of clear satin polyurethane finish. After preservation there were two-hundred four nails available for study, ranging in length from 16 to 225 mm.

In developing a working typology two factors were considered of prime importance: head design and shank length. Head design is important in determining the function of a nail type (Nelson 1968:6). Four head types were found representing two classes of nails, framing and finish. Framing includes rosehead and flathead with flathead strictly functional and rosehead both functional and used for decorative studding. Finish nails were composed of T-head and L-head brads. This head design allows the countersinking of the nail head flat with a finish surface parallel to grain. Figure 26 shows these general head types. The length of a nail is proportional to the thickness of wood to be fastened. Five length categories were developed in reference to this relationship. Criteria used in developing these categories will be discussed at the end of this section.

Figure 26. Architectural Nail Types by Head Design,
Building A

- a. Rosehead
- b. Flathead
- c. T-head
- d. T-head
- e. Wide-head estoperoles
- f. L-head

Figure 27. T-head Flooring Nails with Similar Bend



Head Design Analysis--In order to assess the differential functions (if any) of these nail types in relationship to Building A, six computer-generated density contour SYMAPS were produced to illustrate their spatial distribution. Figure 28 represents these SYMAPS reduced and transferred to standard graphics.

The first map produced was that of all two-hundred four preserved nails from all four strata (Figure 28a). There appears to be an overall distribution, both interior and exterior, of nails with concentrations associated with each room; however, Room 3 appears to have the highest deposition.

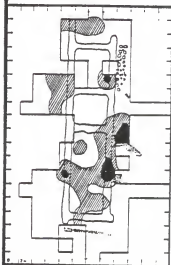
The remaining five maps were produced using the one-hundred forty-six preserved nails from Stratum II because this stratum represents the most important period of architectural deposition directly related to Building A.

Table 1 shows that Stratum II contains 67.8% of all nail or nail fragments excavated at Building A. These one-hundred forty-six preserved nails represent 84.4% of all two-hundred four preserved nails.

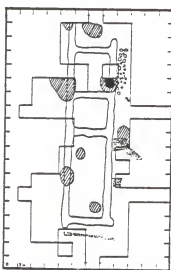
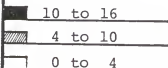
Table 1. Nails Excavated by Stratum, Building A

Stratum	Whole Nails	Nail Fragments	Total	% of Total
I	38	106	144	14.9
II	173	481	654	67.8
III	41	110	151	15.7
IV	5	10	15	1.6
I-IV	257	707	964	100.0

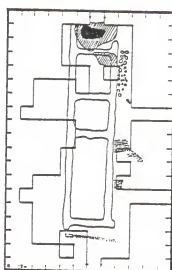
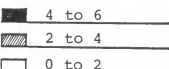
By frequency



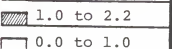
a. All nails
Total 204



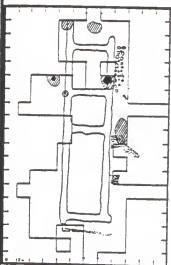
b. Framing nails
Total 70



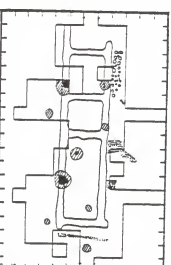
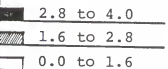
c. Structural nails
Total 19
2.2 to 3.0



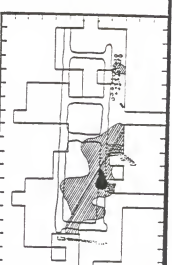
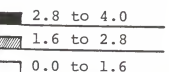
By frequency



d. Flathead nails
Total 31



e. Rosehead nails
Total 39



f. Finish nails
(T and L)
Total 57
4.6 to 7.0

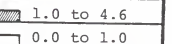


Figure 28. Iron Nails, Building A

a. All strata

b. - f. Stratum II

The next step involved producing maps of all framing nails (rosehead and flathead <115 mm) and structural nails (all nails $\geq$ 115 mm). Framing nail concentrations (Figure 28b) again are noted in association with each room; however, the interior of the structure is relatively empty. These factors agree with the framing nails' general function as well as the fact that the walls with which they would be associated fell outward.

It is striking that all the structural nails are concentrated at the north end of Room 1. This spatial arrangement plus the nails' large size suggests specialized use to fasten together large structural wooden timbers at this location.

Next, maps were produced of the two subsets of framing nails, flathead (functional) and rosehead (functional/decorative) (Figures 28c and d). The flathead nail distribution shows concentrations centering around Rooms 1 and 2, primarily the exterior of the structure. The rosehead distribution shows a different pattern with concentrations primarily associated with Room 3 and with smaller concentrations in Rooms 1 and 2. The western wall appears to have the greatest concentrations, especially the southwestern wall segment. This major concentration is at the same location as numerous arch bricks and cut stone, suggesting a rosehead nail-studded wooden door. A similar pattern is suggested (less strongly) at the

west wall junction of Rooms 1 and 2 where a concentration appears adjacent to the location of an arch brick, indicating a wall opening. The concentration of this functional/decorative nail type around the southern half of the structure (interior and exterior) suggests a decorative function associated with this sector of the building.

One final nail type distribution was mapped, that of finishing nails (T-head and L-head < 115 mm in length). The two head types were combined since their functions are similar and only four L-head were present as opposed to fifty-three T-head. This group of nails, by far the most numerous of all recovered, appears to be associated with the interior of Room 3, except for a small concentration just east of Room 1 (Figure 28f). This interior concentration suggests their use in either flooring and roofing. With walls falling outward, both flooring and roofing would collapse more or less straight downward (flooring more so than roofing). Several other factors weigh in favor of flooring: 1) this nail type appears to be almost exclusively associated with Room 3 with a minor overlap into Room 2; 2) Strata III and IV in Rooms 2 and 3 were much less compacted than that of Room 1, suggesting heterogenous flooring practices; 3) nail distribution associated with the roof framing would present an overall homogenous pattern (as illustrated in the framing nail map, Figure 28b); 4) the T- and L-head nail

is a finish nail designed to be nailed with the head parallel to the wood grain so that it can be countersunk flush leaving a smooth surface. This nail type is primarily used in finished flooring or paneling (Nelson 1968:6), roof framing would not require a finish nail; and, 5) the interior walls were covered with fine white and black-line painted plaster; this combined with the fact that wall-associated features fell outward suggest they were not used for panelling, as does their average length of 94 mm.

The length of these nails suggests use in joining a 4 to 6 cm plank to a larger wooden member. This would be an appropriate-sized, load-bearing plank for use in flooring. After collapse of the structure these planks would have been in direct contact with the moist soil and would have rapidly decomposed due to the termite, fungal, and bacterial wood-destroying organisms found in the tropics. Less than a year of such exposure would render them to crumbling splinters, if not total decomposition. Thus, when the squatter/buccaneer occupants (post 1578) set up house in the ruins, the rotten wooden debris was cleared out along with the roof and wall debris from the interior, leaving numerous nails remaining on the interior of Room 3, Stratum II.

Two other distinct nail types were recovered during excavation in the category of "Other". The first is a flat-headed nail with a large diameter head

(Figure 26e). Function of this nail is probably that of holding a loose material prone to shifting, such as fabric or matting. This type is similar to present-day nails used to fasten tar paper and asphalt shingles. Such nails are also reported from the early 16th-century site of Nueva Cadiz, an island pearl fishery off the coast of Venezuela (Willis 1976:159). Lyon (1979:113) notes, "When the 1566 succor fleet came to Florida, the ship's holds were lined with matting fastened in place with short tacks with round wide heads--these were called estoperoles."

Two of the three nails of this type came from the vicinity of Room 2 and one from the vicinity of Room 3. Nail dimensions are 30 mm long with 28 mm diameter head, 40 mm long with 20 mm diameter head, and 55 mm long with a 22 mm head.

The second "Other" category nail contains five apparent horseshoe nails (Figure 55e). All present a flattened T-shaped head with head thickness tapering towards the edges; all have a similar bending pattern near their tip. This bend is the result of their being clenched over after passing through the exterior of the horse's hoof. Four measure 30 mm and the fifth 40mm in length. All come from Stratum II, one each adjacent to Rooms 1 and 2 and three adjacent to Room 3.

Nail Length Analysis--As previously stated, nail length is proportional to the thickness of the wood member to be joined. The general rule is a nail should be

between 1.5 and 2 times the thickness of the board it is joining. This range of length ratio allows for variance due to numerous factors (such as wood density, grain direction, cross-sectional shape, and dimensions of nail shank), all of which affect the choice of the ideal nail size (Graham 1923:4,7,48). All two-hundred four nails from all four strata were analyzed.

The first nail type examined was that of the finish flooring nails. These are characterized by their large number, uniform length (associated with a uniform function), and the fact that twenty-three exhibited a similar bend pattern, as if the two wood members joined were pried apart (intentionally or due to collapse) (Figure 27). Examination of the nails would be most likely to produce a known 16th-century Spanish nail length-to-board thickness relationship. Once this is established the relationship as nail length increased and decreased can be extrapolated.

It is apparent from Figure 29 that the bending occurs at the union of the floor board to its supporting member. Thus, measurements were made of these nails from top of head (being countersunk into planking) to the center of the bend. The resulting average of these measurements, 56 mm, is an estimate of the floor plank thickness. Put in functional terms relevant to modern lumber practice, this is slightly over 2-1/8 in, or 1/2 in thicker than the modern standard "two by..." planed stock

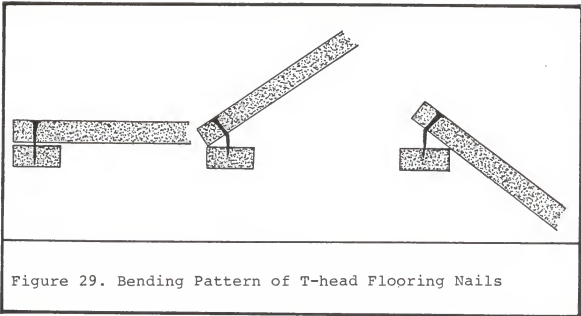


Figure 29. Bending Pattern of T-head Flooring Nails

(1-5/8 in thick) used today in similar dock, decking, and flooring construction. A board of this thickness is quite satisfactory as a sturdy hand-hewn or sawn floor planking.

The range of board thickness is between 38 and 65 mm (Figure 30); however, only two bent nails out of twenty-three are less than 49 mm. Thus perhaps a more realistic range is between 49 and 65 mm. This thickness range will be referred to as "two by..." stock, noting its variation inherent in hand versus machine hewing.

It is possible to estimate the other timber sizes used in general framing from the combined framing nails by extrapolating from the known relationship between flooring nail length and plank thickness. The lower end of the finish nail lengths (Figure 32a) demonstrate that five samples drop off markedly from the uniform flooring nails, the largest of which, at 46 mm, would be used in

joining a member from 23 to 30.7 mm thick or roughly a 1-in-thick board (using the general rule that a nail should be between 1.5 and 2 times the thickness of the wood).

Thus, it seems that the board sizes used in general framing at Building A show two general thicknesses, resemblant to modern designations of "one by..." and "two by..." stock. With this in mind, the minimum length flooring finish nail, 65 mm, was used as the dividing point of the general framing nails designated for "two by..." and "one by..." stock. The minimum nail length in this category is 25 mm, capable of joining a board from 12.5 to 17 mm or 1/2- to 5/8-in thick. The smallest nail, at 16 mm, is designated as a tack, capable of joining stock from 8 to 10.7 mm or 5/16 to 3/8 in.

Figures 33a and 33b, rosehead and flathead framing nails, show two breaks in the pattern of each nail between 105 to 115 mm and 80 to 90 mm. These pattern breaks plus the median position of the 80 to 90 mm length of flooring nails, firmly associated with their use with "two by..." stock, indicate 115 mm as the break point separating general framing from major structural nails.

Nails $\geq$ 115 mm also appeared to have a greater overall thickness to length ratio than the other nails, signifying their function as a structural fastener or spike (Graham 1923:35). This division is in part subjective since nail thickness varied much more in the

sample from the vagaries of preservation than did length and was consequently too unreliable to warrant measurement. It is easier to distinguish the original head and point of an eroded nail than to distinguish the original but now-eroded shank surfaces.

It is apparent that these structural nails (all of which clustered around Room 1; Figures 28c and 32b) measure from 115 to 153 mm with the exception of an immense rosehead octagonal shank spike 225 mm long (Figure 26a). These measurements indicate numerous structural framing elements from 57 to 102 mm thick (2-1/4 to 4 in) and the presence of a major structural timber from 113 to 150 mm (4-1/4 to 6 in) thick.

Lyon describes the use of wooden members in the construction of a new church at San Antonio de Monte Plata which verifies the existence in 16th-century Spanish construction practices of such structural framing members possessing a standard thickness within range of 57 to 102 mm (2-1/4 to 4 in). This was a new town established in the Dominican Republic in 1605 for the displaced persons from towns such as Bayaha, depopulated as a result of the 1605 order. These members are described as "ochavados (probably means ochaveros--18 foot members, squared and worked), azepillados (probably worked with a plane), with a thickness of three inches and a width of six fingers, (about 4.2 inches)" (Lyon 1981:4).

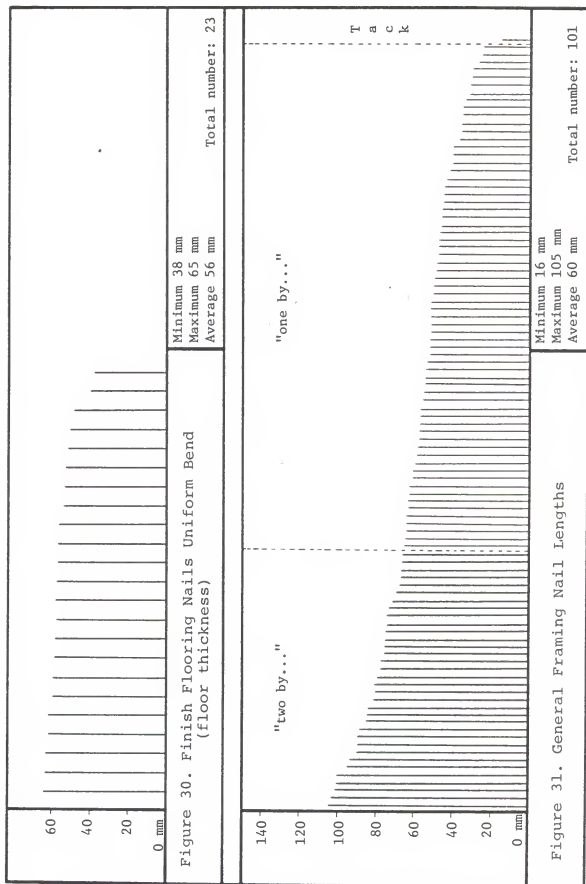
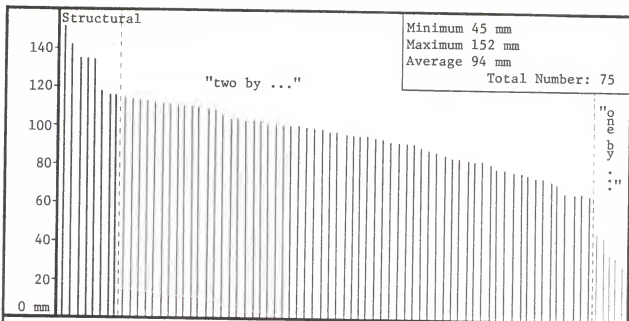
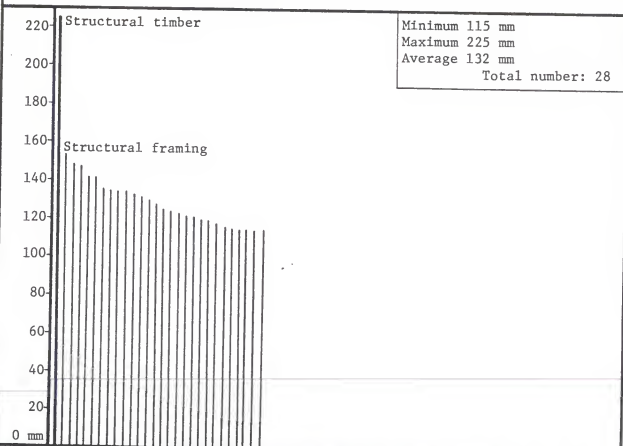


Figure 31. General Framing Nail Lengths

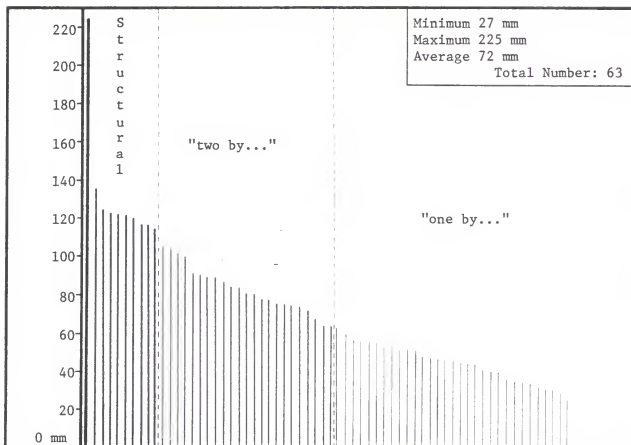


a. Finish nail lengths (T- and L-head)

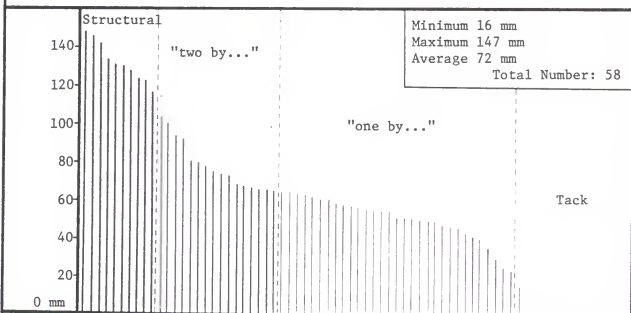


b. All structural nail lengths

Figure 32. Finish and Structural Nail Lengths, Building A



a. Rosehead: general framing and structural



b. Flathead: general framing and structural

Figure 33. Framing Nails, Building A

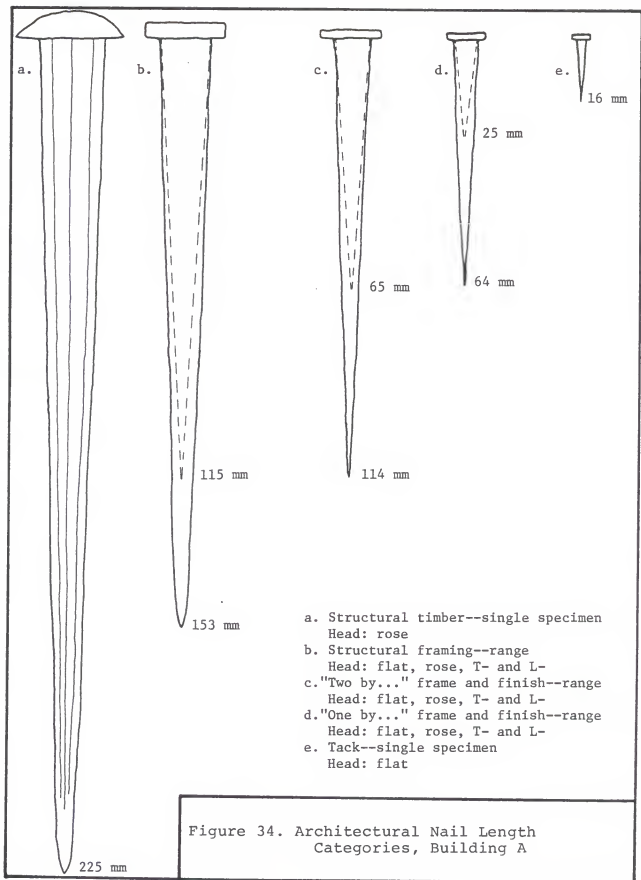
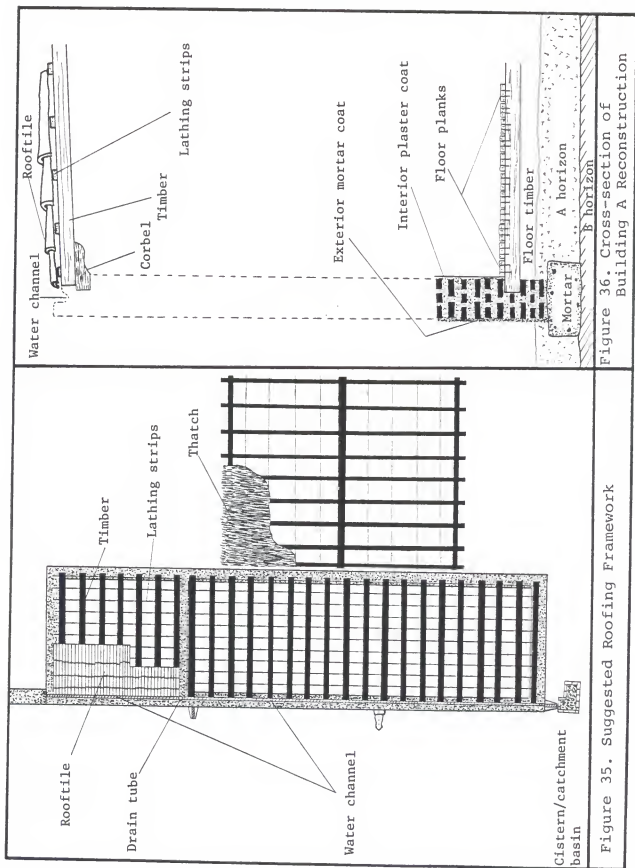


Figure 34 illustrates the construction nail types arranged by shank length from Building A. When referring to these or any nail categories, it should be kept in mind that all nail length functional categories will have a fair amount of overlap due to many variables, including wood type, wood density, nail type availability, and experience and preferences of carpenter.

Masonry and Wood Frame

The following section attempts to combine the results of masonry and frame analysis. Where direct physical evidence is lacking, similar traditional 16th- and 17th-century Spanish colonial architectural practices described by George Kubler (1940; 1948) will be utilized.

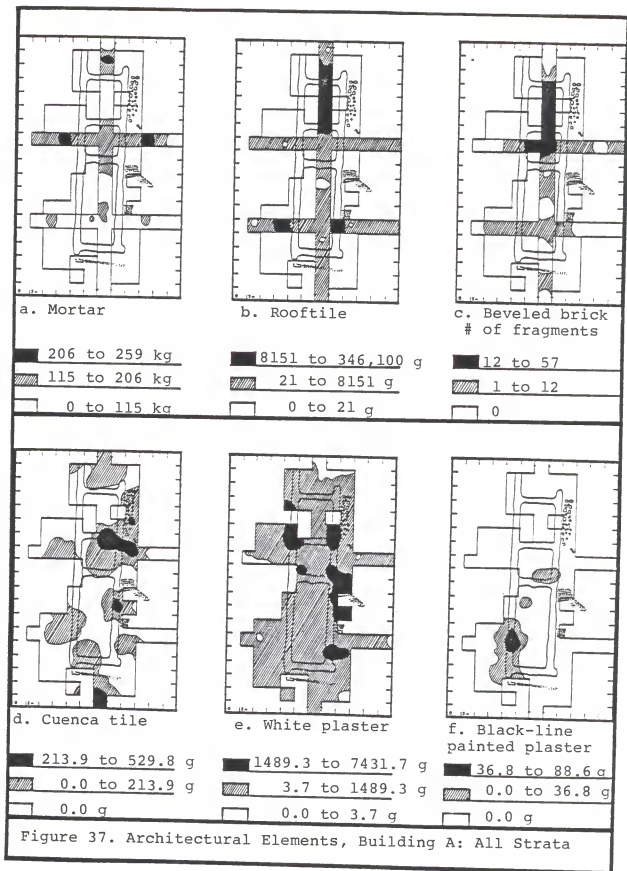
Figure 36 illustrates a cross-section view of Building A, Room 3. At the base is the monolithic mortar wall foundation followed by standard brickwork featuring thick mortar joints. The supporting floor joist timbers are shown as being inset into niches in the masonry walls. This technique is extrapolated from the practice of setting horizontal wooden members into a masonry wall for use as scaffolding (Voelker personal communication, 1984) and roofing supports (Kubler 1940:32). The "two by..." floor planking is nailed at right angles to these supports. Planking is placed running parallel to the longitudinal axis of the structure as shown in Kubler's illustration of a similar 17th-century New Mexico structure (1940: plate 183).



Roofing is the next major concern. Figure 37b represents the spatial distribution of rooftile at Building A. This clay tile is the traditional Spanish "barrel" variety. Only one nearly complete specimen was excavated. It measured 42 cm in length and tapered from 19 to 9 cm in width (Figure 18). A concentration of rooftile occurred in Room 1 (described in more detail in the section on Room 1 features). More important than this concentrated pile of broken rooftile, in terms of judging general roofing practices, is the overall presence of some rooftile across the entire structure. The distribution is more exterior than interior; it exhibits another relatively high concentration east and west of the south end of Room 3.

This pattern supports the hypothesis that the entire roof was covered with barrel tile and that the squatter occupants cleared the interior of Rooms 2 and 3 prior to setting up house. The tile debris was deposited primarily in Room 1 and exterior to the southern end of Room 3. The clearing operation was designed to work efficiently from the center toward the two ends of the building.

The configuration of the roof is interpreted as a flat sloping surface as opposed to a peaked surface for several reasons: 1) the occurrence of the only water channeling and storage devices on the west side of the structure (gargoyles and catchment basin); 2) the lack of



archeological indications of a "drip line" on any side of the structure; and, 3) the presence of a paved use area on the east side of the structure.

When describing roofing of this type Kubler states there is not only lateral or side-to-side inclination but also longitudinal pitch (slope from one end to the other). The lateral inclination can vary from as little as 4 in to over 1 ft, dependent upon the width of the roof. The longitudinal pitch averages 1 ft in 100 ft (Kubler 1940:44,45). To determine the lateral drop one can extrapolate from Kubler's description of an exceptionally wide span for such a flat roof as being 33 ft. The maximum span would necessitate the maximum range of drop mentioned above as 1 ft producing a ratio of .36-in drop per 1 ft of span. Thus in spanning the 7 m (22.9 ft) at Building A there should be a drop of approximately 8-1/4 in. The longitudinal pitch from the south end of Room 1 to south end of Room 3 (20 m or 65.6 ft) should be just over 7-3/4 in at the rate of 1 ft for each 100 ft. Along the top of the western wall would be a southerly sloping channel, made from rooftile set in mortar or wooden planks (Kubler 1940:44), which carried runoff to the southwest corner through the fluted gargoyle to the catchment basin below. The provision of such a catchment basin or cistern in association with a flat sloping roof was a common and desired architectural practice in Spanish colonial architecture, especially churches.

At Tepeca, Tecali, or Ucareo, the form of these conventual cisterns may be studied in detail. Another ruined specimen is behind the church at Totolapan in Morelos, stone lined, immediately adjacent to the church, and fed by the runoff from the church and conventual roofs. Hence a functional dependence between the flat-roof systems and cisterns can be proposed. (Kubler 1948:229)

The catchment basin/cistern found at Building A can be seen in Figure 17d. Its height can only be estimated at 1 m, more or less waist-high. Such a configuration would hold approximately half a cubic meter of drinking water.

Figure 35 presents the probable technique of roof construction. First, beams would be laid spanning the structure, spaced from 18 to 24 in apart and resting on wooden corbels which projected from the wall's interior to add support and disperse the load (Kubler 1940:43). Next, lathing strips would be nailed at right angles across the beams in preparation for laying the barrel rooftile in an overlapping, "shingle-like" fashion. The increased occurrence of mortar and large structural nails at the north end of Building A plus an occurrence of T-head flooring nails at Room 1 suggest a second story for this room. The location of the northern fluted gargoyle at the top of the wall-fall adjacent to the southern wall of Room 1 in turn suggests a fluctuation in wall height (Figure 14). This would be the proper location if it was designed to expel the runoff via drain pipe from the Room 1 roof.

This roof would be similarly constructed, sloping west and south (to avoid spilling water on the raised rock and earth platform on its east side). The runoff would be channeled down a drain tube, wooden or masonry, to the first floor roof and out the fluted gargoyle.

Dry-Laid Stone Platforms

The three areas of intense exterior stone deposition (Figure 14) are interesting in that there is no mortar adhering to their surfaces and the spaces between the stone are filled with a brown sandy soil. The function ascribed to these areas is that they were part of a raised dry-laid, dirt-filled stone platform. Due to the plastic nature of the silty, floodplain soil surface during the rainy seasons, these areas would allow drier, less muddy access to the structure.

At the southern end of the structure a fan-shaped platform radiates outward and a well-defined pathway leads southeast towards the third largest earthen mound in the central building complex as well as to the adjacent area of dry-laid brick pavement (Figure 14). These two raised platforms may have served to direct foot traffic toward the southern doorway entrance.

A massive rectangular dry-laid stone platform abuts the east side of Room 1 (Figures 14 and 16c). This platform is approximately 30 to 40 cm higher than the Stratum III ground surface in this area and runs the length

of the room. A dry-laid brick path can be seen at its southeast corner, running at an angle toward the center of the proposed open pole structure which covers a dry-laid brick pavement. At the southern end of this platform a series of bricks parallel the angled face of the platform. This position suggests their use as a brick facing for the step up onto the platform. The lining of step faces with brick, boards, or stone slabs is a common feature for this period and style architecture (Kubler 1940:50,51).

The function of this platform is probably as a base for a wooden exterior staircase serving the upper story of Room 1. Kubler describes a church staircase at Acoma, New Mexico that he considers "characteristic" of such elements. Although the wooden treads probably do not date to the 17th century construction date of the church, the size and number of these treads are probably the same as the original since the stairwell remained the same. Each of the sixteen risers are 9.6 in (24.4 cm) high with 7-in (17.8-cm)-wide treads. The staircase itself is 2 ft 10 in wide (Kubler 1940:49).

These dimension ratios will be used to reconstruct the exterior staircase and estimate the height of the first story. To derive the number of risers, and thus the first story height, the horizontal length of the staircase must first be defined then divided by 17.8 cm, the length of each tread. The horizontal length of the staircase is arrived at by measuring from the southern end of the stone

platform to the northernmost extent of the staircase. This point is estimated to be at least 2 ft 10 in (86.5 cm) south of the Room 1 north wall's interior surface. This measurement would provide a minimum square landing area and door opening. The landing could be extended northward several feet against the buttress to provide a larger platform servicing the doorway. Thus, the maximum horizontal length of the staircase is 495 cm, giving a total of twenty-eight risers at 24.4 cm high each and producing a total height of 6.8 m (which is close to the 6.5-m wall height estimated through measurement of the intact wall fall).

Interior Decoration

Three forms of interior decoration present in the archeological assemblage will be discussed: beveled brick, cuenca tile, and plaster (plain white and black-line painted).

Beveled brick is a rectangular general purpose brick that has had the linear edges along one wide face knocked off by a mason's trowel or hammer (Figures 17c and 18). A density contour map was produced of such bricks from all strata in the 1979 trench sample; however, the bricks were predominantly from Stratum II. The concentration shown in Room 1 was primarily made up of several linear configurations of such brick oriented roughly east-west and underlying the pile of roof tile, thus pre-dating

its deposition (Figure 37c). The definite linear alignment of these bricks, perpendicular to the lateral walls, combined with their interior location suggests a vertical linear wall placement (Figure 17c). Although seemingly concentrated in this room, beveled bricks occurred throughout the structure, primarily within the interior. The deposition pattern, the linear orientation at right angle to the side walls, and the small amount of mortar-like material found attached (a thin, fine white plaster on the widest flat surface) suggest that these bricks represent a form of false-column vertical-ribbing interior veneer. Their reddish-brown earthtone contrasts with the stark white wall plaster to which they adhered. Upon fracture of the walls, these lightly cemented decorative elements would fall immediately to the interior while the rest of the walls fell outward. Figures 14 and 17c show the actual patterning of these bricks: linear alignment in Room 1; overall dispersal in Room 2; and clustering around the arched doorway on the west side of Room 3.

The next density contour map presented is that for the distribution of cuenca tile (Figure 37d). This decorative wall tile was found throughout the structure, but was more prevalent toward the southern end, with high concentrations at the south exterior end of Room 3 and north interior wall of Room 2. All this cuenca polychrome tile has a lily-like floral motif distinctive of Goggin's

classification of type B cuenca tile, as opposed to the Moorish-influenced geometric design on the type A tile (Goggin 1968:145). Decorative tile and other fenestration is commonly found around doorway facades, windows, and other fenestration as well as appearing in rectangular panels along a wall surface (Kubler 1948:232) (Figure 38a). It is used in both sacred and secular structures (Goggin 1968:145,146).

The interior walls of the entire structure were coated with a fine white plaster (Figure 37e). In addition to plain white plaster, fragments of white plaster were found with curving black-painted lines 1 to 2 cm wide on their surface (Figure 38b). Figure 37f plots their distribution, primarily around the arched doorway on the west wall of Room 3 along with a concentration in the southeast corner of Room 2. Such fragments suggest monochrome curvilinear or fleur-de-lis pattern applied to the interior wall surfaces of Rooms 2 and 3. Such decoration on white plaster is described by Kubler for the earliest known original interior wall surface of a 17th-century Spanish Colonial church in New Mexico at Giusewa in the Jemez canyon.

The draftsmanship is firm and bold, striving to recompose the conventional lily pattern into the asymmetrical, dislocated forms of Keresan ceramic design. From the fragment, there may be inferred the presence of mutual decoration in other churches of the seventeenth century. (1940:65)

Figure 38. Interior Wall Decoration

- a. Cuenca tile
- b. Black-line (curvilinear patterned) painted plaster



Building A: Function

Building A is the largest, most diversely ornamented masonry structure occupying a centralized position within the highly regulated and stylized built-environment of this early 16th-century Spanish colonial grid town. Figure 39 helps provide this perspective by presenting a composite base map of the major elements identified through archeology in this central town sector. Building A may be used as a reference point. The solid black lines indicate excavated foundation trenches while the dashed lines indicate the extrapolated positions of foundation trenches. These extrapolations are made from Willis' 1979 and 1980 excavations at Building A, Gary Shapiro's 1980 electrical resistivity survey (Shapiro 1984), and Rochelle Marrinan's limited perimeter foundation trench test excavations at the adjacent masonry structure, Building B (Marrinan 1983).

In direct association with Buildings A and B is a cemetery. This cemetery abuts the western edge of Building B and is intersected by an east-west linear arrangement of large post holes. The extent of this cemetery was delineated through a 5-m-interval gridwork of test pits. Multiple use of the same burial area was discovered during Dr. Hodges' 1980 cemetery excavation of a 2 X 3 m unit. The corpse was aligned at right angles to Building A, head west, feet east facing Building A

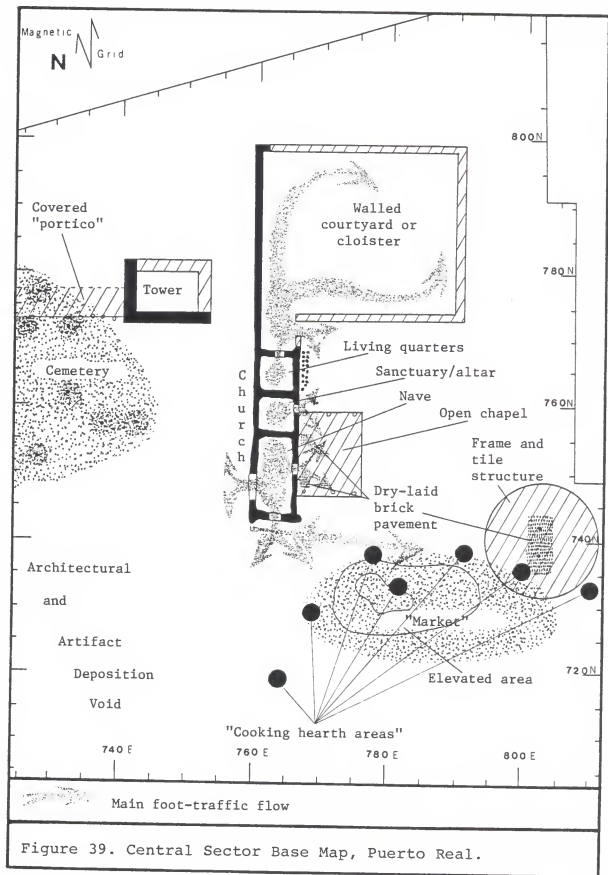


Figure 39. Central Sector Base Map, Puerto Real.

(Figure 8d). Southeast of Building A is the third largest earthen mound in the central building complex and an adjacent area of dry-laid brick pavement. At first glance this area appears to represent another large masonry structure, but analysis of the masonry material distribution maps shows very little of these materials at this location. Minor concentrations of roof tile and nails indicate that some form of pole structure or structures were located here. Analysis of the test pit material assemblage indicates that it may have been a raised market area (see Chapter VIII).

The large sector southwest of Building A, although not resistivity mapped, shows little fluctuation in topography and no significant amounts of historic artifacts.

With these factors in mind what function can be ascribed to Building A? The conclusion reached by this author, a conclusion assumed as true throughout this study thus far, is that it must be the church. Numerous pieces of data point to this function. The first is its central location, large size, and masonry construction. Also, its exterior and interior are highly decorated. Relevant to these elements is the later 1573 town planning ordinances which state the church--

shall be separated from any other nearby building, or from adjoining buildings, and ought to be seen from all sides so that it can be decorated better, thus acquiring more authority; efforts should be made that it be somewhat raised from ground level in order that

it be approached by steps, and near it, next to the main plaza, the royal council and *cabildo* and customs houses shall be built. [These shall be built] in a manner that would not embarrass the temple but add to its prestige. (Crouch, Garr, and Mundiago 1982:15)

Thus, the church should be the most decorated of the major structures of the town. The decorative features described earlier--wall top crenelation, cut stone, polychrome floral motif cuenca tile, and painted fleur-de-lis on plaster--all are known to be associated with liturgical as well as secular architecture of this period in Santo Domingo and Mexico (Goggin 1968:145,146; Kubler 1948:100; Baird 1962: 120, plate 76). Building A is the only structure at Puerto Real known to possess carved stone gargoyles, columns, and capitals. The mere presence of the gargoyles is not necessarily indicative of a church; it is their presence at Building A and apparently nowhere else that is indicative of a church.

The animistic gargoyle with the head of an elephant, body of a sheep and feet of a calf presents a religious concept--a being with cloven hoof and sheep imagery. This gargoyle was non-functional since its water channel was plugged by mortar and brick. We can conclude that this gargoyle was placed on the wall for a solely decorative and/or symbolic purpose. This reflects the tradition of European medieval churches, which developed the use of the animistic, half-beast, half-demon gargoyle to incorporate local deities into the physical manifestation of the church as it spread across Europe

(Sheridan and Ross 1975:12). For this gargoyle, its symbolism was its major function; its use as a water spout was merely secondary.

It is the close proximity of this structure to the cemetery and the corpse's right angle foot-first alignment relative to it that strongly support this structure's being the church of Puerto Real (Foster 1960: 148; Kubler 1948:320).

In addition to the above factors, the rectangular shape, length-to-width ratio, vertical massing, exterior buttressing, walled courtyard, and adjoining thatch-roofed pole structure all fall within the stylistic parameters of the early 16th-century, single-nave, monastic churches found in Mexico. Kubler (1948:232) gives a summation of the qualities embodied by such a structure.

First, the church is emplaced with some regard to military defense at or near the center of an open, unfortified town. Second, its plan reveals a simple single-naved disposition, with or without transept . . . Third, the structure is gothicizing wherever the local resources permitted. . . . The massing of the church is distinguished by a few more or less regularly disposed buttresses, especially at the corners of the structure. The fenestration is sparse and often irregular, situated high in the lateral walls. Fourth, the massing is extremely simple, tending toward great altitude on a narrow plan. . . . Fifth, the visual effect is that of a lightly castellated structure. . . . At intervals in the high, blank, and austere walls, occasional panels of rich ornament are disposed, at the facade and lateral doorway. The total effect is that of a battle settlement in which it is the refuge, the citadel, and the communal center.

Before it can be concluded that Building A is a church, the matter of its non-traditional orientation

must be addressed. The traditional orientation of the Spanish Colonial church is east-west with its sanctuary/altar located at the eastern end and main entrance on the opposing west end. However, in Kubler's extensive study of Spanish Colonial churches in Mexico and New Mexico he finds that, "it is the exception when the churches are properly oriented . . . in fact, buildings are more likely to face south than west, as at Abo, Quari, Giusewa, the old church at Taos pueblo and smaller buildings at La Bajada or Los Colonias." He submits this apparent ambivalence toward formal rules is rather the adjustments which must be made to local site conditions (Kubler 1940:23).

Two environmental factors which were of prime importance in laying out a grid town (to which the orientation of the church is tied) are those of prevailing wind direction and location on the banks of a river (Crouch, Garr, and Mundigo 1982:14,15), both dominant factors of the environment at Puerto Real.

The orientation rules were only flexible in relation to the points of the compass and general grid plan. Of prime importance was the adherence to the rules of the relative orientation of architectural features within the liturgical complex. For single-naved churches Kubler (1948:249) states that their:

simple and austere plan reveals an economical and stereotyped treatment of entrances. The main doorway, in the west facade, is supplemented by only three others: one in the north wall, giving access to a lateral courtyard or cemetery; one in the south wall,

opening upon the cloister walk and conventual buildings; and one in the vicinity of the altar, giving access to the sanctuary.

Figure 40 shows two arrangements: 1) formal, described above; and, 2) Building A's orientation. Although the compass alignment of the structures differ, the relative alignment of architectural features--structures, cemetery, and doorways--are identical.

It is also interesting to note that these rules of orientation were formalized in the latter part of the 16th century as were the ordinances of town planning cited earlier. The data from Puerto Real indicate that the general mental-cultural constructs of these formal models were already being followed by common consent and transmitted verbally at the dawn of the conquest period.

The 1580 Instrucciones fabricae by Cardinal Borromeo state "no doorway, whatever, should be constructed, moreover, at the back, or at the sides of the church, except those which are necessary to go to the sacristy, to the belfry, to the cemetery, or to the dwellings of the servants of the church" (1857:17).

The lateral doorway of these churches in Mexico is used by the congregation today in preference to the main doorway on the structure's end (Kubler 1948:250). That a similar pattern is evident at Building A can be seen in the heavy artifact deposition at this location (Figure 24d) and inferred from the elaborate interior and exterior wall decoration found at this lateral, cemetery-facing doorway.

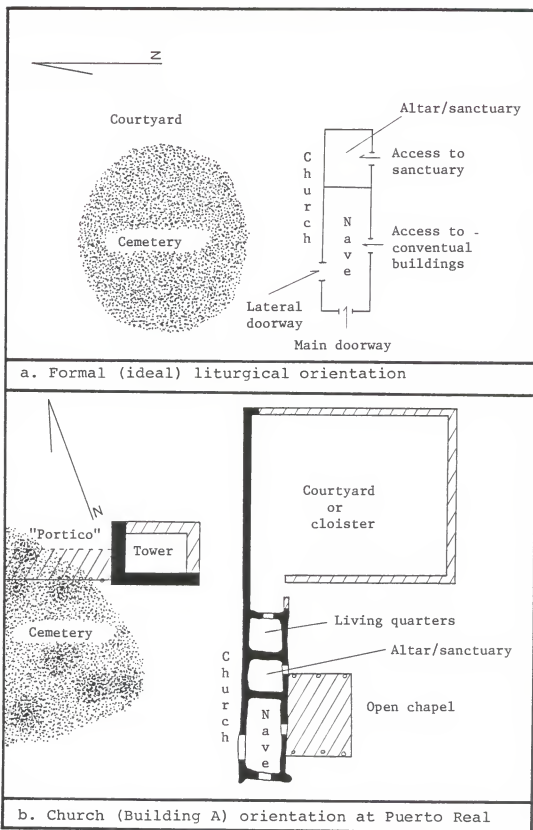


Figure 40. Orientation of Church (Building A)

The burials at Puerto Real are restricted to a cemetery exterior to the church. Although burials within church walls is a known (and in places preferred) practice, it is not the normal form of interment either in the New World or Spain (Kubler 1948:320; Foster 1960: 148,152). The normal practice is burial in a continuous-use cemetery exterior of the church.

Building A as Church: Architectural Implications

With Building A's function as church accepted, some additional architectural interpretations can be postulated. The first involves the function of the adjoining thatch-covered pole structure. This can only be what is described by Kubler as an open chapel. The cultural significance of such a modest structure is a poignant statement on the adaptations the Spaniards were forced to make in their attempts to conquer a New World. "Liturgically, this open chapel is the most original contribution made by the Church in America. The concept of outdoor worship violates the theory of the mystic body of the Church, enclosing the communicants within its actual substance" (Kubler 1940:75).

How this form developed is related to several factors: 1) Moslem architectural antecedents in Granada; 2) Indian preference for outdoor ceremony; 3) large number of Indian "conversions" in the first years of conquest; and, 4) need for a place of worship while the main church construction took place. Whatever the precise combination

of reasons, it seems the last two mentioned would be the most applicable. Due to the length of construction time involved for an elaborate structure such as Building A, a place for worship must have been provided during the interim. After completion of the church the open chapel would have provided an area for the Indian converts, numerous during the first years, to be instructed in religion and language. Kubler (1948:322) notes that these open chapels were largely a manifestation of the early 16th century, being directly linked to the large number of Indian converts, disappearing from use once these numbers started to drop after mid-century in Mexico. A similar and more rapid sequence of demographic events occurred on Hispaniola. It is interesting to note that there is a present-day Catholic open chapel/school located on the north coast near the site of 16th-century Bayaha on Ft. Liberté Bay (Figure 41b). Remove the tin and cover its pole framework with thatch, and one would have a good reconstruction of the open chapel at Puerto Real's church. This present-day open chapel's design is probably the result of scarce materials, low cost, efficient enclosure of space, and a hot humid environment rather than being a direct cultural descendant of imperial Spain. However, these same environmental constraints, if not similar economic considerations, no doubt influenced the design of the open chapel at Puerto Real's church in the 16th century.

- Figure 41. Contemporary Architecture near Puerto Real
- a. 18th century masonry Catholic church at Bord
de Mer Limonade with exterior buttressing
and adjacent tower
 - b. Catholic open chapel at Bayaha
 - c. Construction of rural Haitian house



b.



The masonry walled courtyard attached to the church probably represents the cloister, separated from the physical activities of the surrounding town. Opening into this courtyard are the living quarters of the clergy at Puerto Real, housed in Room 1. Upstairs from this room is the second-story combination belfry, watch tower, and lighthouse. Southward (as indicated from the artifact and interior decoration distribution maps) Room 2, Stratum III, appears to have the least living debris artifacts and one of the highest decorative element concentrations, especially polychrome cuenca tile. This suggests two things: 1) it functioned as the "blind" sanctuary (windowless) which housed the altar and the highly decorated rear wall retablo (frequently featuring polychrome tile panels; Kubler 1948:278); and, 2) the southern foundation cross-wall in Room 2 is not a full wall but only a raised masonry step-like support for a wooden sanctuary floor. Kubler (1940:61) states that the steps up to the altar in the sanctuary are often built of the same material as the walls.

Such a configuration would coincide with the traditional liturgical practice of manipulating the visual imagery of the church interior through perspective illusion. This concept revolves around the focusing of the worshippers' eyes forward and upward to the altar. This was accomplished in several ways. First was a raised altar framed against the brightly decorated retablo

background side-lighted by a doorway or window opening. No windows were allowed in the rear wall of the retable for fear that the intense glare of sunlight would force worshippers' eyes from the altar, thus creating the term "blind" sanctuary (Kubler 1940:61). The floors of the nave usually rise upward from the entrance to the sanctuary. Kubler (1940:69) reports a 17th-century New Mexican church with a rise of 2 ft over the 80 ft from entrance to sanctuary. This inclination ratio would suggest that the floor in Building A would rise some 35 cm over the 14 m between entrance and sanctuary.

The effect of this perspective illusion is to deceive the eye as to the length of the nave. The convergence of apparently parallel lines tricks the mind into believing that the lines are not only parallel but longer than they really are; this creates the illusion of a darkened tunnel of great depth irresistibly drawing the eyes toward a brightly colored, side-lit altar rising up from the sanctuary.

The only illumination provided other than doors at such early churches was that from one or at most three small windows placed high upon one or the other linear nave walls, never both. Building A material did not distinctly indicate the presence of these optional architectural elements; however, the presence of a small circular window is suggested for the southern end of the structure by the recovery of an intact mortared segment

of several tapered archway bricks featuring an arch of small radius (Figure 17a). The postulated opening would be circular with scalloped edges and would be approximately 40 to 50 cm in diameter. Placement of this circular, end-wall window would be high and centered over the entrance doorway. Not only a common element of liturgical architecture, it almost universally served a very functional purpose, that of providing lighting for an elevated choir loft.

Nearly every church was thus provided with its choir loft, varying in size with the population of the settlement. Usually it is a deep gallery as wide as the nave, facing the sanctuary. The floor of the choir loft stands 6-12 feet above the nave. Its depth is rarely more than half the width of the nave. The loft is always lighted from a window in the center of the facade. Access to the loft is supplied either by a door giving directly into the loft from the second-story rooms or from the roof of the adjacent priest's house (Laguna), or, internally, from the nave by a ladder or staircase [Cordova]. . . . The gallery is supported by the end and lateral walls of the nave. At the desired height, a cross timber carries joists of which the opposite ends are embedded in the end wall. . . . The cross timber frequently rests on carved or painted corbels. The beam itself may be squared, carved and painted. (Kubler 1940:58)

From the data provided above, the choir loft indicated by the presence of this specialized window form should be between 2 to 4 m high, measure about 3 m in depth and be reached internally by either a wooden ladder or staircase. Figures 42 and 43 provide an interpretation of the exterior and interior of the church reconstructed from the data presented in this study.

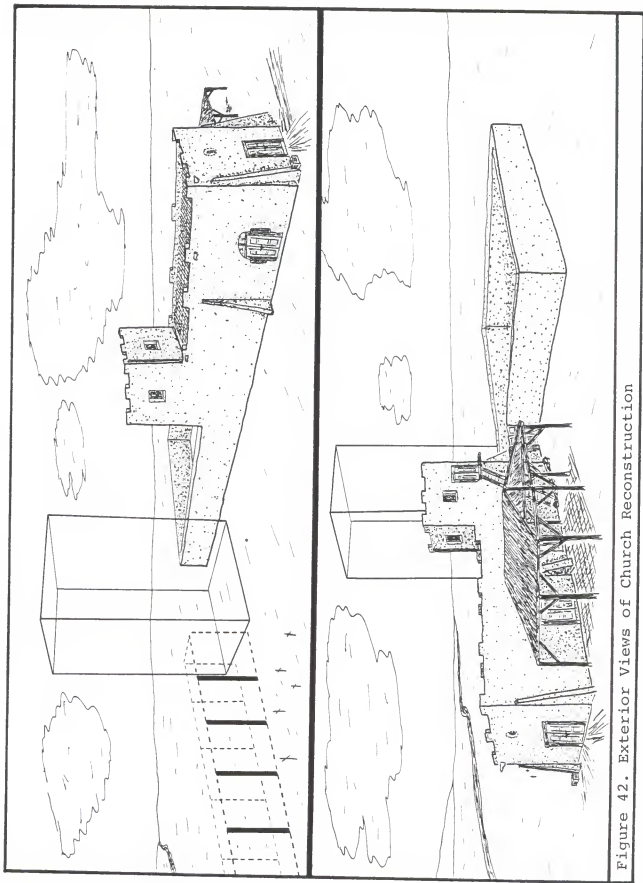
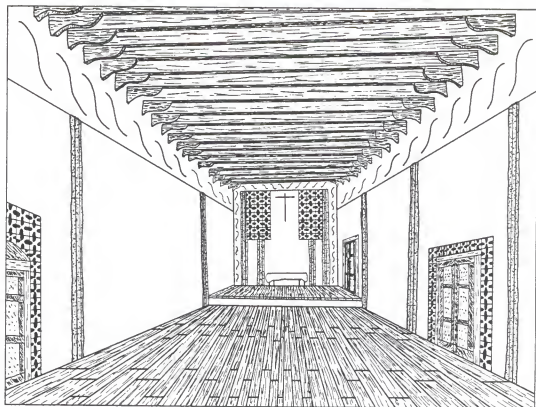
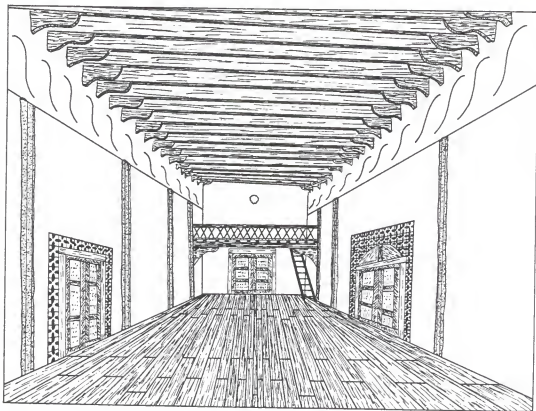


Figure 42. Exterior Views of Church Reconstruction



a. View north toward altar



b. View south toward choir loft and entrance

Figure 43. Interior Views of Church Reconstruction

Building B: The Tower

Building B is a somewhat smaller, nearly square structure with massive walls located immediately west of the north end of the church (Figures 39 and 42). Marrinan's test excavations at the site in 1981 indicate a structure 8 X 10 m with foundation walls twice as wide as those of the church (1.5 to 2 m compared to .8 m) and twice as thick (nearly 1 m as opposed to 40 cm) (Marrinan 1983:9,22). This architectural element is suggested to represent a masonry tower associated with the liturgical complex. Its nearly square configuration and massive walls strongly support this interpretation because there is a direct relationship between thickness of bearing wall, depth and width of foundation, configuration of structure, construction material, and wall height (Kubler 1948:179).

Compared with the church, the construction materials of Building B remain constant while the foundation depth doubles; the width of the bearing wall doubles and the configuration becomes more stable. The only architectural reason for such changes, especially in light of the relative scarcity and expense of masonry construction materials at Puerto Real, would be that the walls are to be increased in height by a factor of at least twice the height of the church. Thus, estimating the highest walls of the church and multiplying by two should give a good estimate of the tower's height.

The height estimated for the floor of Room 1's second story and the roof of Rooms 2 and 3 is 6.5 to 7 m. Thus, adding 2 m (the minimum head clearance acceptable under the choir loft) as the minimum head clearance for this room, a minimum height of the church's second story would be 8.5 to 9 m. These figures suggest a Building B tower height between 17 to 18 m.

The proposed tower was built supplementary to the established liturgical complex at Puerto Real. Such a construction sequence is indicated by traditional town and liturgical building practices as well as archeological evidence. When laying out a town in traditional practice, the first structure to be assigned a lot was the church (Crouch, Garr, and Mundigo 1982:14). Other buildings followed. The process of building a Spanish town is described for early 17th-century Popayan in Columbia.

The relative opulence of the Church stood in marked contrast to the penury manifest in what public buildings existed in town. The treasury could not afford an edifice of its own until the 1750's. Until then, official business was conducted in the residence of one of the officials; it also housed the smelter. Efforts to build a town hall, jail, and slaughterhouse substantial enough to withstand the rigors of the weather occupied the cabildo throughout the century without much result. (Marzahl 1979:14)

Archeological indications that the proposed tower construction post-dates that of the church include the intrusion of its associated linear and post-supported structure into the pre-existing cemetery. This linear arrangement of large post holes probably indicates a

simple covered portico separating the secular activities north of the cemetery from the sanctified ground within the cemetery and adjacent to the church. Such an interpretation is in line with Marrinan's postulated function for this row of post holes as being "a colonnade or some such structure" (1983:52). This interpretation is supported by the high concentrations of barrel roof tile west of the tower overlying these post holes (Figure 76).

One final question remains: why would such a massive tower be needed and what function did it serve? As to why, one needs only to read the Spanish colonial town planning ordinances of 1573 which state: "The temple of the cathedral [principal church] where the town is situated on the coast shall be built in part so that it may be seen on going out to sea and in a place where its buildings may serve as a means of defense for the port itself" (Crouch, Garr, and Mundigo 1982:14). It is thus apparent that the church's original second-story tower served the purpose of watchtower, lighthouse, and belfry.

What then could the Building B massive tower do that the smaller church tower could not? The answer is little, but what it did it did much better. The two primary functions of the massive tower were for defense and commerce--watchtower and lighthouse. Thus, as the cattle herds grew and the illegal rescate trade increased, a taller lighthouse and lookout would have served the residents of Puerto Real. It would allow a reliable

navigational fix for incoming ships day and night, allowing them to pass through its treacherous network of shoals. It also provided a lookout to sight agents of the Crown and possible pirates. Any real Indian threat disappeared early in the century. Both of these functions would have been augmented by increasing the tower's height above the coastal plain.

Such an addition to the liturgical complex would have made sound business sense during the expanding portion of Puerto Real's life cycle. Additional secondary functions for this tower could have been soldier garrison/storeroom, arsenal, customs house, hospital, additional clergy residence, or chapel.

Thus, all factors considered from archeological evidence to architectural inference, Building A represents not merely a church, but a complex liturgical system embodying the manifestation of imperial Spain. It mirrors not only the formalized cultural structure of imperium, but it also reflects the cultural modifications such a structure must have adopted in adjusting to a new world.

CHAPTER VI CHURCH EXCAVATIONS

One-hundred twenty-two excavation units were located at the church in 1979 and 1980. These units were all 2 X 2 m squares. In 1979 their arrangement was that of three exploratory test trenches consisting of thirty-nine units. In 1980 an additional eighty-three units were excavated to reveal the spatial distribution of material associated with the church. Figure 44 illustrates the final stage of the 1980 areal excavations. All excavations were done by natural stratigraphy.

Excavation revealed several areas of intact architectural features associated with the church: foundation segment; wall-fall; brick pavement; and, cistern. After the complete delineation and documentation of these features, excavation was halted in these units. The features were covered with plastic sheeting which was in turn covered with soil to preserve them in situ as aids in the architectural restoration or future exhibition of the church site. Figure 45 outlines these excavation units.

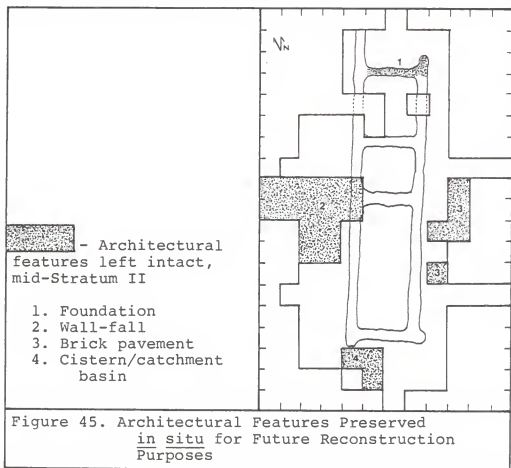
Stratigraphy

Four artifact-bearing strata were dealt with during these excavations (Figures 15b and 46). Stratum I is the first 10 to 20 cm of soil overlying the debris resulting

Figure 44. 1980 Areal Excavations at the Church

Darkened foundation of Building A (church) can be seen in foreground.
Building B (tower) site is located under van in upper left corner of
photograph.





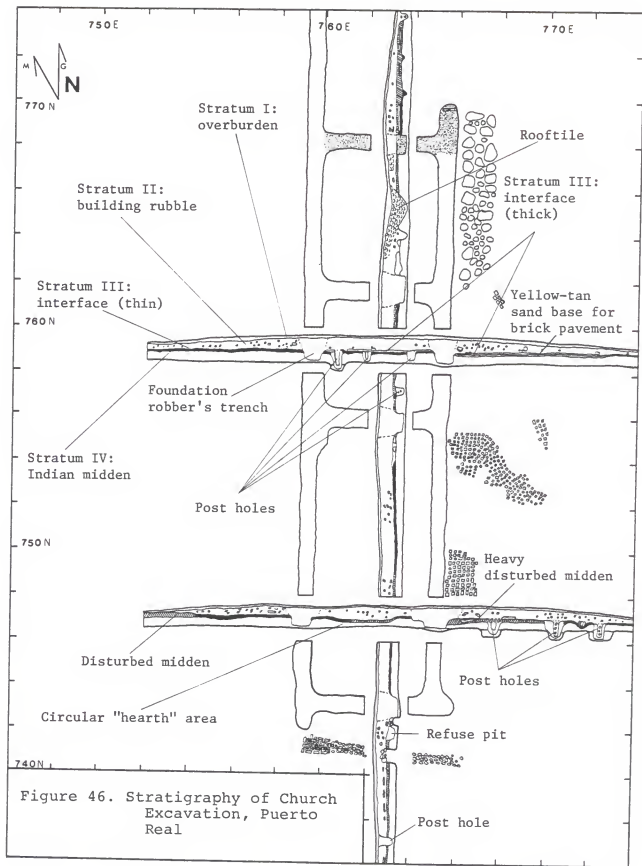


Figure 46. Stratigraphy of Church Excavation, Puerto Real

from the collapse of the church. Stratum II is the layer of wall-fall and construction material debris mixed with occupational midden from an immediate post-Spanish occupation of remnant squatters. Stratum III is the thin and at times elusive zone of post-church imperial Spanish occupation at the site. Stratum IV is the underlying aboriginal midden whose upper zone was mixed with the pre-church Spanish activities at the site. Aboriginal material is that of the Meillac period which predated the Spanish at Puerto Real by approximately one-thousand years according to radiocarbon samples taken. Samples were processed by Beta Analytic, Inc., of Coral Gables, Florida (Table 2).

Table 2. Stratum IV Meillac Component Radiocarbon Dates

Excavation Date Unit	Sample Number
748N 762E 1615 [±] 105 radiocarbon years: A.D. 335 (Beta-1130)	
758N 758E 1810 [±] 95 radiocarbon years: A.D. 140 (Beta-1131)	
758N 756E 1310 [±] 105 radiocarbon years: A.D. 640 (Beta-1132)	
746N 762E 1125 [±] 110 radiocarbon years: A.D. 825 (Beta-1133)	
746N 762E 1270 [±] 200 radiocarbon years: A.D. 680 (Beta-1134)	

Samples were taken from the two least disturbed, intense midden areas encountered during excavations. The time period for Meillac occupation tends to support Rouse's and Rainey's contention that the Meillac period predates the later Carrier period in Haiti. The Carrier period represents the aboriginal population present at

time of Spanish contact (Rainey 1941:19; Rouse 1941:177). Due to the apparent thousand-year gap between this Meillac occupation and that of 16th-century Puerto Real, the aboriginal material has been deleted from analysis in this study.

These strata represent several discrete time periods. Strata IV and III represent the period of imperial Spain at Puerto Real, firmly dated at 1503-1578. Stratum IV represents the pre-church imperial Spanish era of initial colonization, from 1503 to the construction of the church.

The church construction which ends Stratum IV and begins Stratum III is estimated to fall between 1504 and 1513. This estimate is proposed for several reasons: 1) construction time for a masonry structure of this size and type during the 16th and 17th centuries would probably take six months to one year, depending on material availability, labor, and motivation (Kubler 1940:39); and, 2) the presence of the open chapel indicates the need to provide large numbers of Indians with a place to observe worship and learn the Spanish language during the first few years of colonization (Kubler 1948:322). The native Indians were eliminated largely by 1509 and the Lucayan Indians (for whom Puerto Real served as a major holding area prior to their out-shipment to Tierra Firme) were decimated by 1513 (Hodges 1979:3; Sauer 1969:160).

Thus a 1510[±]5-year terminal date is postulated for the end of Stratum IV and beginning of Stratum III.

Stratum III represents the active life of the church and the mature phase of this imperial town's life cycle, 1510[±]5 to 1578. The year 1578 is when Spain officially closed the town and moved the populace to Bayaha on Ft. Liberté Bay. Archeological evidence suggests that the church was razed during this pullout as were the structures of Bayaha twenty-three years later when Spain ordered its depopulation.

That an actual razing of the church occurred (accompanied or perhaps brought about by physical resistance to this order of abandonment) is supported by several factors. An intact rapier was found directly underneath the building rubble, its point section apparently being broken upon impact of the wall fall. The lock associated with the southern door was in its locked position upon deposition. This suggests that the main door to the church was locked shut at the time of its destruction.

It is assumed that the residents of the town left quickly since the three gargoyles and other cut stone were left behind. Although the animal-shaped gargoyle was broken upon impact, the two fluted water spouts were in good working order. The end of the south gargoyle (Figure 22) was broken off with a sledge hammer by a Cuban sugar-cane-company pilot looking for gold.

Dr. Hodges rescued it before it was totally destroyed. The gargoyles would have made desired additions to the fenestration of the planned masonry church at Bayaha for which bricks and rooftile were already stockpiled (Lyon 1981:6).

The testimonies given by residents of Puerto Real in their 1572 lawsuit to the crown requesting that the port's registry not be closed suggest resistance to relocate and reasons for subsequent imperially planned destruction of the town's structures. Each resident stressed that, if abandoned, Puerto Real would become a haven for runaway slaves and other enemies of the crown, i.e., competing European nations (Lyon 1981:2-20). The actual account of the relocation process by Estaban de Quero states that "almost all of them" (the vecinos) of Puerto Real left willingly (Lyon 1981:11). This statement implies that some citizens did not leave willingly.

These combined factors suggest that the forced abandonment of Puerto Real followed the same pattern as that documented for Bayaha twenty-three years later in response to the 1605 depopulation order. There, the majority left willingly. The remainder, primarily blacks, mulattos, and others of low imperially defined status, resisted their relocation violently. The survivors remained in the vicinity to carry on the established rescate pattern of cow hunting and hide trade, free from control by Spain (Moya Pons 1977:58-59).

Stratum II begins in 1578 and represents the remnant squatter population which occupied the ruined masonry church in informal lean-to-type structures. A terminal date for this stratum is placed at 1605, date of the final official Spanish depopulation of northwest Hispaniola. Continued occupation much past this date is not likely since Stratum II material culture is 16th-century Spanish in nature. The nearby now-abandoned Ft. Liberté Bay would have provided a safer and by far more easily navigated harbor to continue the established rescate pattern of cow hunting and hide shipment.

Stratum I represents the time period 1605 to the 20th century.

Thus, the postulated temporal parameters for the excavations at the church of Puerto Real are 1) Stratum IV, 1503 to 1510⁺⁵ years; 2) Stratum III, 1510⁺⁵ years to 1578; 3) Stratum II, 1578 to 1605; and, 4) Stratum I, 1605 to the 20th century.

Material Culture: Church and Central Sector Test Pit Grid

Tables 3 to 20 and 23 to 39 list the non-faunal material cultural assemblage recovered from the church excavations and the surrounding central sector test pit grid. Overall, this assemblage exhibits a fairly standard representation of 16th-century Iberian ceramic, metal, and glass types. This assemblage is comparable to other early Spanish Caribbean colonial sites such as Nueva Cadiz on

Cubagua island off the coast of Venezuela (Willis 1976). The ceramic class of maiolica represented in the present excavations tends to overlap the 16th-century portions of three of Goggin's ceramic traditions: Medieval, Chinese-Popular, and Italian-Talevera (Goggin 1968:207.208).

General descriptions of the ceramics will be presented outlining decoration, form, and chronological placement. Place of origin, if not Spain (and if known), will also be included. For in depth description of similar ceramic types the reader is referred to Deagan (1978), Fairbanks (1973), Goggin (1968), and Lister and Lister (1982).

Historic Ceramics

General provenience and percent occurrence data for ceramics from the church excavations is found in Tables 3, 6,9,12,15, and 18. Similar data for the central sector test pit grid is found in Table 27.

Maiolica: Church--Columbia plain. The most common 16th century maiolica, this is a plain white tin-enameled earthenware on a pink to cream base. Excavated forms include small bowl (escudilla), simple plates, and vertical walled albarello (drug jar) (Goggin 1968:117-125).

Columbia plain green. This is a variant of the traditional white type with a clear green glaze over the white. The same forms as above were present, 16th century (Goggin 1968:118).

Isabela polychrome. Blue concentric lines contain stylized alafia designs on a white to cream base. It dates from early to mid-16th century. Only an escudilla form was excavated (Goggin 1968:126-127).

Yayal blue on white. This type exhibits two or three dark blue concentric lines around the vessel rim and base over a dull white surface. Material excavated included simple plate and escudilla forms, early 16th century (Goggin 1968:128-130).

Santo Domingo blue on white. This type is identified by blue concentric lines with sporadic "dashes or meanders" on a cream colored base dating from the last half of the 16th to the first third of the 17th century. The excavated form was that of an escudilla (Goggin 1968:131-134).

Montelupo polychrome. Described as a "polychrome with harsh orange, very dark blue, light blue and yellow fillers outlined in black" (Lister and Lister 1982:72), this Italian maiolica seems representative of the first half of the 16th century and was represented in the excavated materials by simple plate and escudilla forms.

Ligurian blue on blue. "A thin, delicate, blue ground ware carrying fine darker blue patterns, occasionally brightened by a patch of yellow" (Lister and Lister 1982:72), this Italian maiolica is identified with the second half of the 16th century. Excavated material revealed primarily plate and escudilla forms.

Faenza white. This is a thin, light "blemish free, velvety, intensely white, hard glaze" Italian maiolica that "started before the middle of the 16th century, continued popular in Europe through much of the 17th century" (Lister and Lister 1982:77). The only excavated form was a simple plate.

Cuenca tile: Type B. A decorative polychrome wall-panel tile featuring a floral motif. All excavated tile was of this Type B variety, 16th century (Goggin 1968:144).

Maiolica: Central Sector Test Pit Grid (Additional Types)--

Columbia plain gunmetal. A minor variant of Columbia plain white "that bears a darkened, rather than white, ground . . . varies from a dense iridescent black to light speckled grey," 16th century (Lister and Lister 1982:48). Excavated forms were simple plate and escudilla.

Caparra blue. This type features a dark blue exterior and white interior surface of an arbarello form. It dates primarily to the first half of the 16th century, perhaps a little later (Goggin 1968:135).

Montelupo blue on white. An Italian maiolica of light firing clay which "bears a dark blue banded pattern of arabesques and small scale floral scrolls that may occur on both surfaces " (Lister and Lister 1982:72). This type is representative of the first half of the 16th century. The excavated form was that of a bowl, or escudilla-type vessel.

Figure 47. Maiolica from Church and Central Sector Test Pit Grid

- a. Columbia plain
- b. Columbia plain green
- c. Columbia plain gunmetal
- d. Yayal blue on white
- e. Santo Domingo blue on white
- f. Isabela polychrome
- g. Caparra blue
- h. Montelupo polychrome
- i. Montelupo blue on white
- j. Faenza white
- k. Ligurian blue on blue

Figure 48. Ceramic Class "Other" from Church and Central Sector Test Pit Grid

- a. Kaolin pipes
- b. Colono ware
- c. Oriental blue on white porcelain
- d. Rheinisch/Cologne stoneware

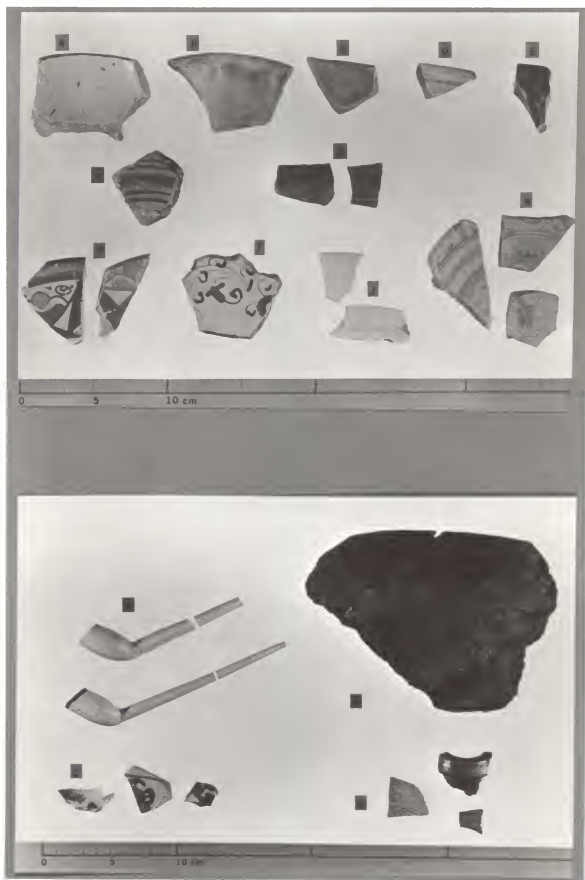


Figure 47 illustrates specimens of maiolica from both church excavations and test pits.

Utilitarian Earthenwares: Church and Central Sector Test Pit Grid--

Honey colored/Seville ware. This is the fourth largest category of ceramics following Columbia plain, olive jar, and Colono ware (these four types make up 59%, by number, of the total ceramics excavated). This type exhibits a cream-colored paste coated with a clear, light to medium brown-honey-colored lead glaze. Excavated forms include the escudilla, plate, and pitcher forms. Figure 72f illustrates a complete pitcher recovered from a single test pit. This type dates from early 16th to early 17th centuries (Council 1975:93; Fairbanks 1973:167; Goggin 1968:227; Willis 1976:126).

Olive jar. This is the common amphora-shaped storage vessel (glazed and unglazed) ubiquitous to the Spanish New World empire. Its primary use was in the transport and storage of olive oil, olives in brine, and wine. However, its many and varied secondary uses (water storage being of major importance) has led Goggin to term the olive jar "the five-gallon can of Colonial times" (1960:23). Of the three datable rim fragments recovered, two were Early Style ca. 1500 to 1580 from Stratum III and one was Middle Style ca. 1580 to 1800 from Stratum II.

Green glazed basin. This is a common lead glazed earthenware at 16th century Spanish colonial sites. Its

basic form is that of a large flat-bottomed vessel up to 1 m in diameter called a lebrillo with walls up to 30+ mm in thickness. Its function was that of either a wash basin or perhaps communal food bowl. As the name implies, the interior was covered with a thick, clear, green, lead glaze with a matte finish (Fairbanks 1973: 167; Goggin 1968:226; Willis 1976:124).

El Morro ware. This pottery is wheel-thrown and poorly smoothed exhibiting uniform paste, being porous yet compact. It is tempered with sand in great enough quantity and granular size to be easily detected by sight or touch. The paste can vary in color from tan-buff or grey-buff to red-buff. A thin lead glaze is applied to the interior surface of the vessel commonly leaving an irregular band of glaze along the exterior. The base is usually unglazed. The glaze varies in color from a pale yellow-orange to a dark brown or olive green (Willis 1976: 128). This ware was first described by Hale Smith (1962: 68,69). The excavated forms were a shallow bowl and simple plate. This ware was quite prevalent at early 16th-century Nueva Cadiz, and Deagan records its use until the very early 19th century at St. Augustine (1976:94).

Feldspar inlaid redware. This is a thin, hard, well-made, red-colored, unglazed earthenware distinguished by the applique of feldspar chips on its surface and distinct incised line designs (Fairbanks 1973:169). Excavated form indicates a small bowl shape.

Thin unglazed redware. This is identical to the above but does not possess feldspar or incised designs; it is probably from an undecorated portion of the vessel. Excavated form indicates small bowl shape.

Orange micaceous ware. This type is described by Council (1975:131-133) and is represented here by fragments of a small bowl form, unglazed orangish in color with apparent mica inclusions.

Unglazed redware. This type is a generalized category composed of thick coarse-grained unglazed red paste ceramics. Forms excavated and identified were that of flat-based jars and small shallow bowls.

Unglazed earthenware. This is the same as above, but not exhibiting a red paste color; it is usually tan to terra cotta.

Green glazed ware. This minor type resembled the Columbia plain green variant in glaze and forms excavated, except that it had a darker green color and much harder paste.

Green glazed lattice. This type was represented by three small green glazed fragments of a lattice-shaped ceramic decorative motif (Figure 50c).

Yellow glazed redware. This ceramic type occurred primarily in post-1578 contexts within the church (58.8% in Stratum II and 38.2% in Stratum I; only 2.9% in Stratum III and none in Stratum IV) and does not appear to resemble any known Spanish ceramic form (Deagan, personal communication, 1984). Its presence

suggests non-Spanish European contact with the post-1578 squatter inhabitants of the church through rescate trade. The excavated form was that of a deep rather straight-walled bowl with a rolled rim. Its fine-grained, hard red paste was coated on the interior surface and rim with a fairly thick yellow to olive lead glaze.

Figures 49 and 50 illustrate specimens of the utilitarian earthenwares described in this section.

Other Ceramics: Church and Central Sector Test Pit Grid--

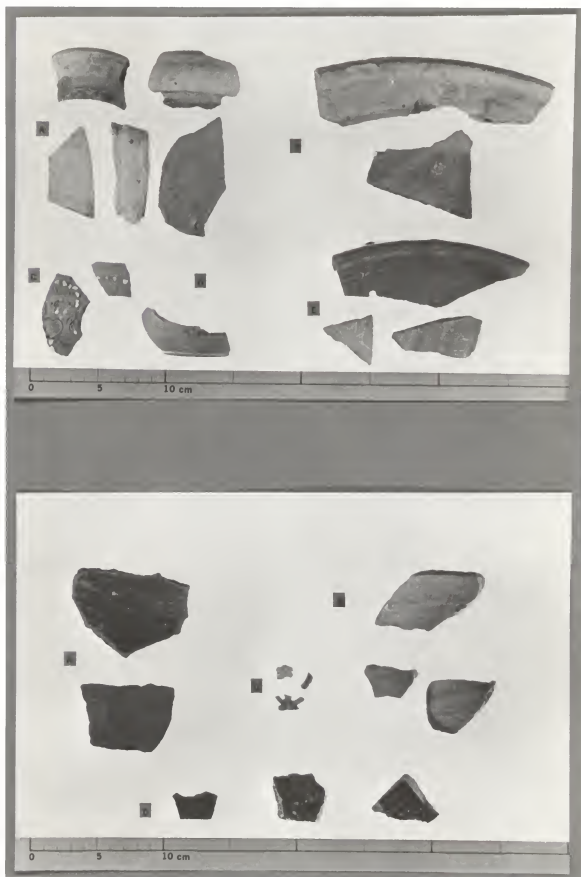
Colono ware. Although this type is the simplest and most basic non-wheel-thrown ceramic excavated, it is also one of the most interesting. It is the third largest category of ceramics excavated and is postulated to have resulted from the European-black African contact situation. The pottery is relatively crudely made, thick (up to 18 mm), and probably low-fired in a reduction atmosphere as its non-decorated, buff to black, at times gritty paste suggests. All excavated sherds indicate a simple hemispherical bowl form (Figure 51). The function of this bowl appears to be that of a general cooking-pot resembling the widely used, present-day Haitian hand-cast hemispherical aluminum cooking-pot. Its frequency increased dramatically as the imperial Spanish influence dwindled, especially post-1578 (Stratum IV, 5.6%; Stratum III, 22.4%; Stratum II, 55.9%; and, Stratum I, 16.1%).

Figure 49. Utilitarian Earthenware from Church and Central Sector Test Pit Grid

- a. Olive jar (top left: early style rim; top right: middle style rim)
- b. Green glazed basin
- c. Feldspar inlaid redware
- d. Thin unglazed redware
- e. Yellow glazed redware

Figure 50. Additional Utilitarian Earthenware from Church and Central Sector Test Pit Grid

- a. El Morro ware
- b. Honey colored/Seville ware
- c. Green glazed lattice
- d. Green glazed ware



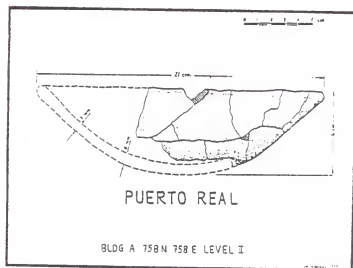
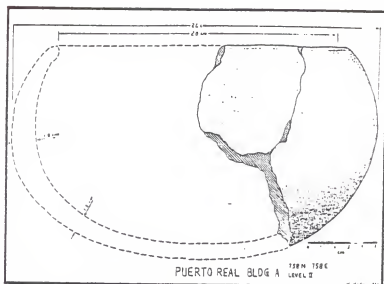


Figure 51. Colono Ware Bowl Reconstructions

During excavations and preliminary analysis this pottery type was tentatively referred to as "Colono-Indian." This was done because it was obviously a non-wheel-thrown and quite unrefined earthenware primarily represented by a simple undecorated hemispheric bowl (Figures 48 and 51). This ceramic type resembled no contemporary European ceramic nor appeared to be the result of the traditional local aboriginal ceramic assemblages, Meillac or Carrier.

The Colono-Indian term was used to designate its supposed hybrid property, the result of European contact with aboriginal populations (Noël Hume 1962:5). Such culture contact changes in aboriginal ceramic styles have been widely reported in North America (Fairbanks 1962; Noël Hume 1962; South 1974). In addition to this Colono-Indian hybrid, several authors, most notably Leland Ferguson, have suggested the possibility of a second hybrid type resulting from the European-African slave contact situation (Ferguson 1980:14-28).

This crude ceramic type increased drastically throughout the life cycle of the town. Its most dramatic increase came after the 1578 official abandonment of Puerto Real and razing of the church. This indicates that the original assumption that this pottery was the result of an Indian-Spanish cultural cross was wrong. Indians on Hispaniola had been largely eliminated by 1509, and by 1513 the neighboring Bahamas had been stripped clean of their aboriginal inhabitants (Sauer 1969:160).

The declining aboriginal labor force was replaced with the introduction of a new cultural system, that of the black African slave. Sauer states that, although a few Negroes had been imported during the first years of Ovando's rule, it was primarily after Hispaniola's economy had shifted from gold to agriculture and the Indians been eradicated (around 1515) that mass importation of Negro slaves began (Sauer 1969:207).

Thus, since this new pottery does not appear to be of European origin and there were increasingly few Indians left to develop and sustain a new ceramic assemblage, it appears that this was not a Colono-Indian hybrid but more likely a Colono-African hybrid. The relative percentages of this pottery shift appropriately with these temporal shifts in demography at Puerto Real.

The increase in relative percentage of this Colono ware at Puerto Real mirrors the increasing African-hybrid population as well as the decreasing Spanish population from Hispaniola following the Cortez conquests (1520) on Tierra Firme. The dramatic increase of this pottery after 1578 is of major significance. Using the documented results of the 1605 depopulation of Bayaha as a model, it can be inferred that, while the Spaniards obeyed the edict to abandon Puerto Real, a number of mulattos and blacks would not. As Moya Pons describes this rebellion at Bayaha, "This was a true popular rebellion of the common people, the mulattos and free

negros seeing the depopulation as the beginning of their ruin" (1977:58-59).

Inherent in these differing reactions to the edict of empire is that the Spaniards had the most invested in their position within the imperial society while the black and mulatto had the least. For this group the move into more direct control of imperium would mean even more rigid confinement within his or her status niche.

Rheinish/Cologne stoneware (bellarmine). This minor type (five fragments) is a "grey bodied stoneware coated with an iron oxide slip that broke into a brown mottle when fired in a saltglaze kiln" (Noël Hume 1970:55). Hume dates the earliest example to 1550 and latest to the first quarter of the 18th century.

Oriental blue on white porcelain. This minor type (twelve fragments) reflects the wide-ranging network of Iberian trade into the Pacific during the 16th century and perhaps the advent of the Manila Galleon trade in 1571. This trade innovation allowed Spanish ships to sail from the Orient and unload on Panama's Pacific west coast. Goods were then taken overland to the east coast and shipped throughout the Caribbean. Their fragile nature and high cost imply a high status.

Kaolin pipe. This rather numerous type is significant temporally because it only occurs in post-1578 contexts (Strata I and II). The Spanish manner of smoking tobacco was in the form of a cigar (Deagan 1983:

246). Tobacco smoking in non-Spanish Europe (origin of these pipes) did not gain general acceptance until the last quarter of the 16th century (Mackenzie 1958:83). The presence of so many of these early kaolin pipe fragments at the very beginning of the period of non-Spanish European use of tobacco strongly suggests a definite and intense period of non-Spanish European contact with the post-1578 squatters at Puerto Real. This no doubt results from a continuation of the rescate trade.

Figure 48 illustrates specimens of the above described ceramics.

Red clay pipe. A single specimen from Stratum I was made for use with a hollow reed inserted into a hole in the bowl.

Minor late ceramics. From all of the excavations only three vessel-form ceramics were recovered which reflect any 18th-century French disturbance of the site. These were two sherds of white faience and one sherd of white porcelain, all from test pits. The greatest significance of these finds is that they reinforce the relative undisturbed nature of the Puerto Real occupation which was restricted to the 16th and early 17th centuries.

Historic Metals: Church and Central Sector Test Pit Grid

General provenience and percent occurrence data for metals from the church excavations is found in Tables 4,

7, 10, 13, 16, and 19. Similar data for the central sector test pit grid is found in Table 28.

Knives--Iron knives or knife fragments were found frequently during excavation. Figure 52 illustrates the most complete specimens. Blade lengths ranged from 10 cm (tableknives) to 30 cm (a massive butcher knife). Three methods of attaching handles were apparent: 1) rivets through holes in tang used to hold a two-piece wood or bone handle in place; 2) self-cast iron handle (one was present); and, 3) a technique whereby the tapered tang was set into a socket in a wood or bone handle. This last method was used on the large butcher knife whose .5-cm-thick, 3.7-cm-wide, and 30-cm-long blade could have been a very effective weapon in addition to its functional use in butchering large animals.

One cross-hatched carved bone handle was excavated. This possibly represents a tang and socket hafted table knife (Figure 52d).

Swords and Sword Gear--Four sword or sword blade fragments, one handle section, one brass scabbard tip, one iron scabbard tip, and the decorative butt and tang section of a "left hand" companion dagger were excavated. Combined, these materials present a well-rounded sampling of 16th-century edged weaponry (Figure 53).

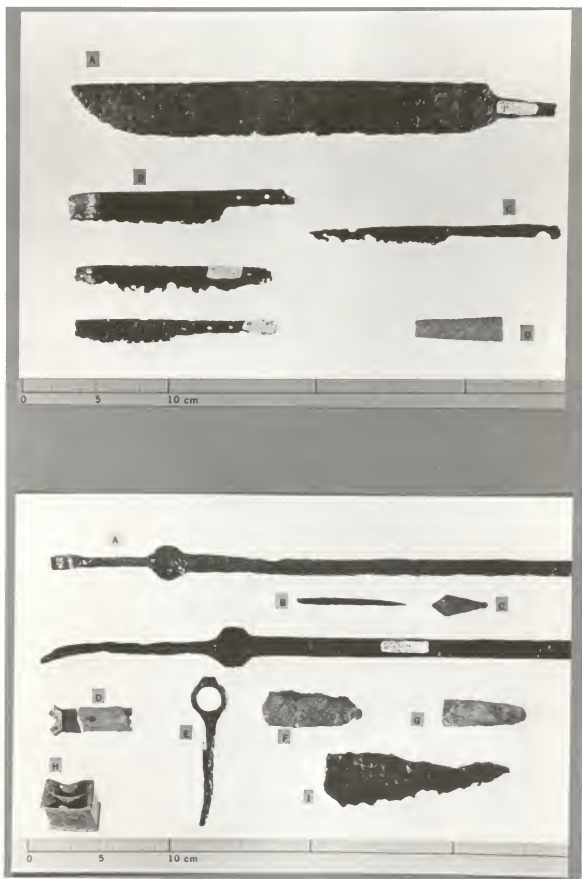
The most well-represented sword type consisted of two rapiers (one 106 cm total length with a 97 cm blade

Figure 52. Iron Knives from Church and Central Sector
Test Pit Grid

- a. Butcher knife: tang in socket handle
- b. Three knives with two-piece handles
fastened by rivets
- c. Knife with self-cast handle
- d. Carved bone handle

Figure 53. Swords and Sword Gear from Church and Central
Sector Test Pit Grid

- a. Rapier handle sections (top rapier, 70 cm
overall length; bottom rapier, 106 cm
overall length)
- b. Tip of top rapier
- c. Brass scabbard tip for a rapier
- d. Left-hand dagger handle
- e. Rapier handle (T-guard)
- f. Iron scabbard tip
- g. Broader sword tip section
- h. Brass scabbard top for sword and companion
dagger
- i. Cutlass tip section



and the other at 70 cm overall with a 61 cm blade, both sharpened only near the tip). Neither possessed attached handles, either because they were removed prior to deposition or were victims of accelerated differential decomposition.

Handle guards for this type weapon varied from a simple T-shaped piece to an elaborate metal basket or cage. In constructing the handle, the guard piece was first slipped over the tang, coming to rest against a flattened flange. This was followed by a wooden grip which was held in place by a metal pommel and capped by a metal "button" attached to the tang's end. The wooden grip was fitted over the tang which had been heated red-hot, "the tang burning its way through the center of the wood thus ensuring a perfect fit." The wooden grip was then commonly wound with wire to provide a textured "non-slip" surface (Valentine 1968:13,14,15).

The shorter rapier was excavated immediately south of the church on top of Stratum III, directly underneath the masonry rubble. The distal end appeared to have been broken in place at this time (Figure 72d). The longer rapier came from a 20-cm-deep test pit immediately northwest of the tower (Figure 72b), also under rubble and apparently lying on top of the main Spanish deposition stratum. This sword was intact although it had a slight bend near mid-section.

The implications of this pattern of deposition is that the 1578 official town closure might not have been entirely peaceful and that some form of armed resistance was offered. This is the exact pattern that is recorded for Bayaha in 1605 under similar circumstances and basically the same population (Moya Pons 1977:58,59). If this is not the case then it would be hard to postulate why such fine and no doubt expensive weapons were simply left lying on the ground. Rapiers were "gentlemen's" weapons of good steel whose high cost kept them out of the hands of the peasants. Surely even bent, broken, and discarded, they would have been scavenged. Both of these specimens, although slightly damaged, could have been made servicable with little expenditure of effort or loss of effectiveness as a weapon. Both length weapons were used in Spain and Europe in the 16th century, with the shorter sword coming into vogue toward the century's end (Valentine 1968:10). In addition to these two rapier blades, the T-handle portion of a guardpiece was also recovered.

The ornamental dagger butt excavated indicates the specialized two-handed rapier fighting technique with rapier in right hand and dagger in left. This is why it is commonly referred to as a "left hand" dagger (Valentine 1968:55). Once the opponent was impaled with the long blade one could use its leverage to maneuver the loser into safe dagger range. This dagger handle was a two-piece type, held in place by brass rivets.

An 8-cm-long point fragment of a broader sword was recovered as well as a nicely made brass two-slot scabbard top used to house both a long, broad-bladed sword and a companion dagger.

A 14-cm-long tip section of a broad curved cutlass-type blade was recovered from distinct squatter occupation provenience within the church.

Projectile Weapons--

Iron arrow tip. Figure 54a illustrates this small, diamond-shaped tip designed for piercing armor when shot from a crossbow. This point type is common to medieval Europe (Stevens 1980:66).

Iron bore cleaner. Figure 54c shows these two specimens which were screwed into the end of a ramrod and used to scrape the carbon deposits from inside the barrel of a matchlock rifle (Noël Hume 1982:66).

Lead shot. Two spherical lead balls were recovered, 15.1 mm and 16.4 mm in diameter (Figure 54b).

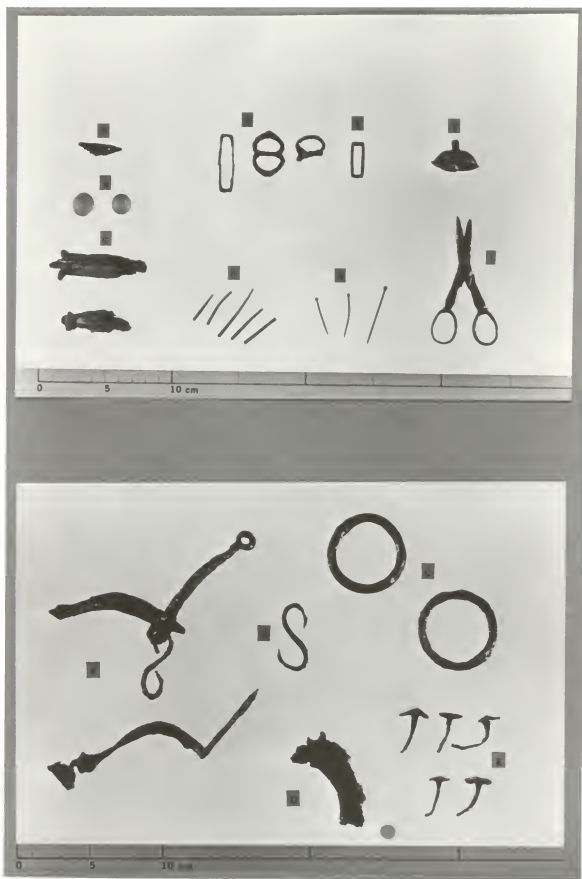
Horse Tackle--Iron horseshoes, horseshoe nails, bits (with associated S-links), and harness O-rings were excavated (Figure 55). These items indicate the use and importance of the horse in the early cattle operations at Puerto Real. Figure 59a is an early 17th-century Peruvian woodcut showing such horse hardware: bit, O-ring, horse shoes, rows of clenched horseshoe nails on the hooves, and a garland of "hawk's bells" around a horse's neck.

Figure 54. Small Metal Artifacts from Church and Central
Sector Test Pit Grid

- a. Iron crossbow bolt tip
- b. Lead shot
- c. Iron bore cleaners
- d. Iron buckles
- e. Brass buckle
- f. Copper hawk's bell
- g. Copper lace tips
- h. Brass straight pins
- i. Iron scissors

Figure 55. Iron Horse Tackle from Church

- a. Bits
- b. Bit S-link
- c. Harness O-rings
- d. Horseshoe
- e. Horseshoe nails



Architectural Hardware--

Iron cotter-key hinge. This is a simple interlocking-U-hinge mechanism used on chest, windows, or doors (Figures 57d and e). Similar hinges are reported for 16th-century Nueva Cadiz (Willis 1976:98).

Iron locks and key. Two lock mechanisms were excavated along with one simple key (Figures 57a,b,c and 58). Although the small lock plate was probably used on a storage chest, the other larger lock plate is a type that was used on late medieval doors (Street 1914:68). The lock's recovery location is from in front of the south end of the church, suggesting a main entrance at this location. It is interesting to note that the locking mechanism is engaged on this lock, suggesting that the main door to the church was locked shut at the time of its destruction.

The smaller lock mechanism was excavated from the Room 1 living quarters and probably is from the inhabitant's storage chest. The simple iron key was found just east of the middle of Room 2. Figures 59b, c, and e illustrate early 17th-century Peruvian examples of these same artifacts. An additional illustration is included of a remarkably similar door lock from a 16th-century liturgical structure in Barcelona, Spain (Street 1914:68).

Figure 58 illustrates the similar lock mechanisms exhibited by both these specimens.

Figure 56. Architectural Hardware from Church

- a. Iron window or door hook-latch
- b. Elaborate iron window or door hook-latch
- c. Door handle
- d. End of large strap-hinge (door)
- e. Door hasp

Figure 57. Locks and Cotter-Key Hinges from Church

- a. Door lock
- b. Chest lock
- c. Key
- d. Large cotter-key hinges
- e. Small cotter-key hinge

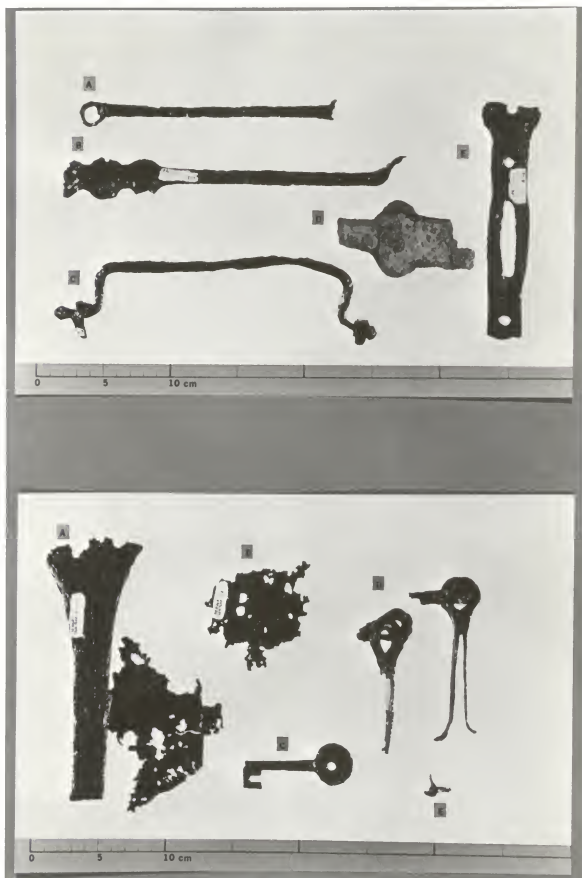


Figure 58. Enlargement of Door and Chest Lock Mechanisms



Door lock

Chest lock

TANBOS
REGVAQVEPAZAEINES
TEREIMO



a.

MAIORDOMOS
DELA ADMINISTRADORDELA

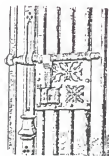


b.

CAPITULO DE LOS PASAJEROS
ESPAÑOLES DELTA
bo y criollos mestizos y mulatos
y criollos mestizos y españoles
cristianos
de castilla



c.



d.

MAIOR
LOS MAIOR DOMOS DE



e.

Figure 59. 17th Century Woodcuts Showing Various Metal Hardware Similar to that Excavated from Church

- Horse tackle and hawk's bells (Poma de Ayala 1613:1083)
- Chest locks (Poma de Ayala 1613:806)
- Chest lock (Poma de Ayala 1613:527)
- 16th century door lock from a Barcelona church (Street 1914:68)
- Door lock (Poma de Ayala 1613:668)

Figures a, b, c, and e were drawn by a 17th century Peruvian Indian, Felipe Guaman Poma de Ayala, in 1613 in his work *La Nueva Corónica y Buen Gobinero*. A facsimile of the original was compiled by Richard Pietschmann in Berlin in 1906.

The presence of these locks and key suggests relatively high status for two reasons: 1) locks themselves in the 16th century were handcrafted items and as such were expensive (Alth 1972:18,19); and, 2) by their existence at the church they indicate that their owners possessed materials of value that needed to be locked up for safe keeping. Figure 59a gives direct evidence of the relative status differentiation between a locking-chest owner and non-owner during this early time period.

Miscellaneous hardware. Several door hinge fragments, a door hook-latch, iron door handle, and simple iron door-hasps were excavated (Figure 56). These last elements express common functional styles prevalent from medieval times to the early 19th century.

Clothing--This group of metal artifacts includes small simple iron and brass buckles, brass straight pins, copper clothing lace tips, and a small pair of scissors. These scissors are of interest in that they come from the latest stratum, Stratum I, and they are nearly identical to a pair illustrated by Noël Hume dated at 1780, the approximate date of the French colonial salvage operations at Puerto Real (Noël Hume 1970:268). Copper hawk's bell fragments were also found (Figures 54d-h).

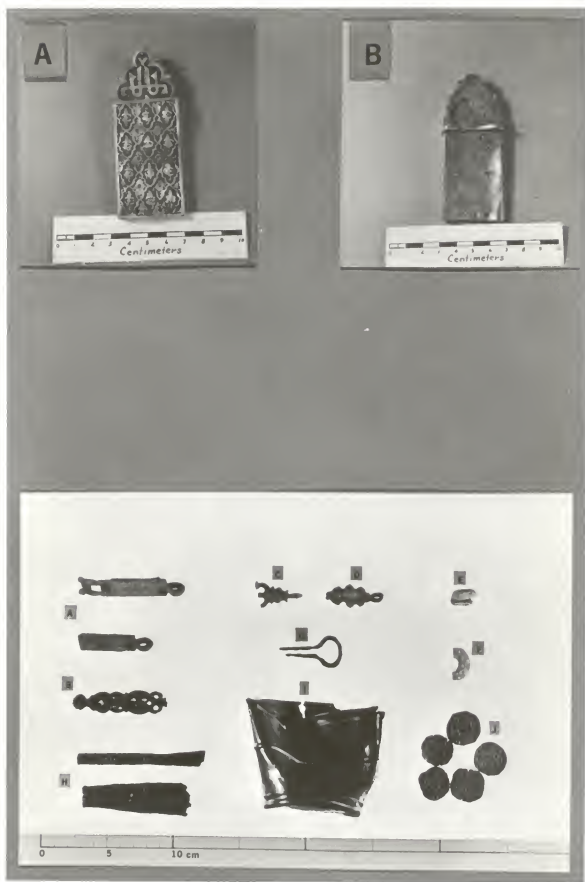
Books--That books were present at Puerto Real is indicated by what appear to be brass book hardware: strap buckles, hinges, and/or clasps (Figures 60 and 61a-d).

Figure 60. Probable Brass Book-Strap Buckle from Church

- a. Front
- b. Back

Figure 61. Brass, Iron, Copper, and Lead Artifacts from
Church and Central Sector Test Pit Grid

- a-d. Probable book hardware (clasps: a and d;
hinge fragments: b and c)
- e. Lead fish net weight
- f. Folded lead washer
- g. Iron jew's-harp
- h. Iron chisels
- i. Brass cup
- j. Copper maravedis



Identification of book hardware presents special problems for the archeologist since few specimens of such early works exist today. They tend to present a sample skewed toward ornate liturgical specimens since the common everyday books were seldom curated with such care as the more elaborate hardware.

Medieval bindings are commonly provided with clasps. The original reason for this was to keep the vellum leaves flat, but of course artistic binders saw that the clasps might be made very ornamental, and so many of them are. . . . Bosses in the centre and at the corners of mediaeval bindings were of structural use, as they protected the actual boards from wear. . . . In the early days books were kept upon their sides . . . so the bosses took the wear and preserved the books. Many of the mediaeval bosses and corners have ornamental settings; they are generally of brass, but sometimes of silver or wood. (Davenport 1907:45)

Figures 62 and 63 illustrate some of the varieties of clasp, hinge, buckle, boss, and corner pieces in use during the 15th and 16th centuries.

The presence of books at Puerto Real and elsewhere in the Spanish New World empire during the 16th century should be expected, a result of increased use of the printing press during this time-period and augmented by the cultural and physical isolation of the colonies. Both of these factors insured that the dispersal of books was an important part of the Indies trade (Vicens Vives 1969:360).

Money--Only one form of money was excavated, the copper 4 maravedi piece. This one coin was well-represented, with one-hundred fifty-nine coming from the church strata. The

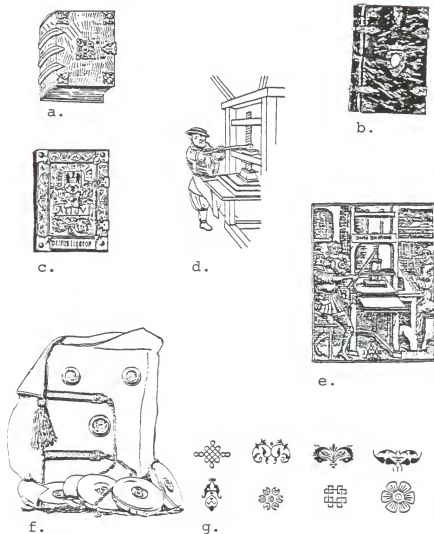


Figure 62. 15th and 16th Century Book Hardware, Markings, and Printing

a-c. Brass book hardware: bosses, cornerpieces, hinges, and clasps (Davenport 1907:45,162,198)

d. Early printing press (Davenport 1907:94)

e. Early printing shop (Bouchot 1890:140)

f. English velvet binding with brass seals (Davenport 1907:148)

g. Italian book stamp designs (Davenport 1907:87)



a.



b.



c.



d.

Figure 63. 15th and 16th Century Examples of Book Hardware

- a-d. Illustrations of the variety of brass hardware and leather strapping techniques used in early book binding: a. (Louisy 1887:1)
 b. (Bouchot 1890:84)
 c. (Louisy 1887:53)
 d. (Louisy 1887:fig.81)

preponderance of this small denomination coin is indicative of either extensive monetary exchanges, the devaluation of imperial monies in general, or a combination of both (Figure 6lj).

Mass Fishing Gear--The presence of a lead fish net weight (a hollow cylindrical piece of lead split lengthwise and crimped on a net's leadline) indicates that mass fish harvesting techniques were in use at Puerto Real during at least its post-1578 squatter occupation (the provenience of this artifact). Present-day Haitian fishermen at adjacent Bord de Mer Limonade utilize similar net weights on cast nets, gill nets, and hand-drawn trawls (Figures 6le and 64).

Miscellaneous Metal Items--These include an intact iron hoe (Figure 66), two iron chisels (Figure 6lh), two iron chain links, two iron rod fragments, ten iron band fragments (possibly from barrel hoops), three L-shaped iron corner brackets (used in furniture or framing construction), four iron jew's-harps (Figure 6lg), a thin brass corner plate, a small brass sheet cut into a crude star shape, and a finely turned brass cup from Stratum II, Room 2 (Figure 6l).

Historic Glass

General provenience and percent occurrence data for glass from the church excavation is found in Tables 5, 8, 11, 14, 17, and 20. Similar data for the central sector test pit grid is found in Table 29.

This group of artifacts was predominantly represented by one major class, that of thinly crafted fine Venetian-style glass made either in Italy or Barcelona. Five different colors of this fragile luxury item were represented in the excavated material: clear, blue, green, clear with white stripe latticino, and opaque red (Figure 65). The sole recognizable vessel form was that of the folded-base stemmed goblet. This assemblage resembles that discussed in detail for 16th-century Nueva Cadiz (Willis 1976:82-90).

Other glass artifacts of note were one small red, white, and blue chevron bead and three unidentified "beads" (Figures 65a and c). All three resemble Venetian-style glassware. The two triangular pieces appear the same in cross section as the folded base of a goblet while the gilded spiral is unique. The strong possibility exists that these are not beads but some form of decorative applique for an elaborate Venetian glassware vessel. The cultural implications of all these artifacts and their distributions at the church will be discussed in Chapters VII, VIII, and IX.

Figure 64. Contemporary Haitian Net-Fishing at Bord de Mer
Limonade



Figure 65. Venetian Glass from Church and Central Sector
Test Pit Grid

- a. Red, white, and blue chevron bead
- b. Clear with raised design
- c. "Beads" or applique details (separated from vessel)
- d. Blue
- e. Blue with red enameling
- f. Opaque red
- g. Clear
- h. Clear with white stripe pattern(folded base of goblet)
- i. Clear with white latticino
- j. Light green

Figure 66. Iron Hoe from Church

- a. Top
- b. Side



Table 3. Summary of Historic Ceramics, Church
 * All final percents rounded to nearest whole

Type	Stratum I			Stratum II			Stratum III			Stratum IV			Strata I-IV		
	#	%		#	%		#	%		#	%		#	%	
Maiolica															
Columbia plain	19	4.7	142	34.8	208	51.0	39	9.5	408	100					
Columbia plain green			8	66.7	3	25.0	1	8.3	12	100					
Yayal blue on white			5	55.6	2	22.2	2	22.2	9	100					
Ligurian blue on blue	6	9.8	35	57.4	16	26.2	4	6.6	61	100					
Santo Domingo blue on white	1	12.5	1	12.5	5	62.5	1	12.5	8	100					
Montelupo polychrome			3	30.0	4	40.0	3	30.0	10	100					
Isabela polychrome	1	100.0							1	100					
Faenza white			8	57.1	6	42.9			14	100					
Total	27	5.2	202	38.6	244	46.7	50	9.6	523	100					
Cuenca tile															
Cuenca tile	3	9.4	16	50.0	13	40.6			32	100					
Total	3	9.4	16	50.0	13	40.6			32	100					
Utilitarian earthenware															
Honey colored/Seville ware	7	5.9	49	41.2	60	50.4	3	2.5	119	100					
Olive jar	41	11.2	146	39.9	165	45.1	14	3.8	366	100					
Green glazed basin	5	9.4	35	66.0	11	20.8	2	3.8	53	100					
El Morro ware			10	12.5	67	83.7	3	3.8	80	100					
Feldspar inlaid redware	1	7.1	3	21.4	8	57.1	2	14.3	14	100					
Orange micaceous ware			9	100.0					9	100					
Un glazed redware	1	1.2	23	27.0	57	67.1	4	4.7	85	100					
Un glazed earthenware	13	14.8	30	34.1	35	39.8	10	11.3	88	100					

Green glazed ware	3	8.6	9	25.7	20	57.1	3	8.6	35	100
Green glazed lattice					3	100.0			3	100
Thin unglazed redware	5	5.7	23	26.1	55	62.5	5	5.7	88	100
Yellow glazed redware	26	38.2	40	58.8	2	2.9			68	100
Total	102	10.0	377	37.4	483	47.9	46	4.6	1008	100
Other										
Colono ware	23	16.1	80	55.9	32	22.4	8	5.6	143	100
Rheinish/Cologne stoneware	1	20.0	1	20.0	3	60.0			5	100
Oriental blue on white porcelain			8	66.7	4	33.3			12	100
Kaolin pipe	14	46.7	16	53.3					30	100
Red clay pipe	1	100.0							1	100
Total	39	20.4	105	55.0	39	20.4	8	4.2	191	100
Historic Ceramics Total										
	171	9.7	700	39.9	779	44.4	104	5.9	1754	100

Table 4. Summary of Historic Metals, Church
 * All final percents rounded to nearest whole

Type	Stratum I			Stratum II			Stratum III			Stratum IV			Strata I-IV		
	#	%		#	%		#	%		#	%		#	%	
Iron															
Knife				5	83.3		1	16.7					6	100	
Chisel	1	50.0					1	50.0					2	100	
Horseshoe				2	40.0		3	60.0					5	100	
Scissors	1	100.0											1	100	
Band				4	40.0		6	60.0					10	100	
Sword				2	66.7		1	33.3					3	100	
Unidentified fragment	15	3.7		312	77.6		65	16.2		10	2.5		402	100	
Plate	1	100.0											1	100	
Cotter-key hinge				2	40.0		2	40.0		1	20.0		5	100	
Horse bit				1	33.3		1	33.3		1	33.3		3	100	
Arrow tip							1	100.0					1	100	
Jew's-harp				3	75.0					1	25.0		4	100	
Latch				2	40.0		1	20.0		2	40.0		5	100	
Key							1	100.0					1	100	
Corner bracket				3	100.0								3	100	
Lock plate	1	50.0					1	50.0					2	100	
Door hinge				1	50.0		1	50.0					2	100	
Door handle				1	100.0								1	100	
-O-ring				4	66.7		2	33.3					6	100	
Chain				1	50.0					1	50.0		2	100	
Hoe blade				2	100.0					1	50.0		2	100	
Buckle				1	100.0								1	100	
Decorative hinge				1	100.0								1	100	
Rod				1	50.0		1	50.0					2	100	
Kettle	1	100.0											1	100	
-S-link	1	50.0											2	100	
Bore cleaner				1	50.0								2	100	
Total	21	4.4		349	73.3		88	18.5		18	3.8		476	100	

Copper												
Maravedi	14	8.8	93	58.5	40	25.2	12	7.5	159	100		
Lace tip			9	45.0	8	40.0	3	15.0	20	100		
Sheet	1	7.7	6	46.1	5	38.5	1	7.7	13	100		
Unidentified fragment	1	100.0							1	100		
Hawk's bell			1	100.0						1	100	
Total	16	8.2	109	56.2	53	27.3	16	8.2	194	100		
Brass												
Straight pin	1	2.5	14	35.9	20	51.3	4	10.3	39	100		
Scabbard tip							1	100.0	1	100		
Book hardware			2	100.0					2	100		
Unidentified fragment			1	50.0	1	50.0			2	100		
Corner plate					1	100.0			1	100		
Star			1	100.0					1	100		
Cup			1	100.0					1	100		
Scabbard top			1	100.0					1	100		
Total	1	2.1	20	41.7	22	45.8	5	10.4	48	100		
Lead												
Unidentified fragment			1	100.0					1	100		
Shot			2	100.0					2	100		
Washer			2	100.0					2	100		
Net weight			1	100.0					1	100		
Total	0	0	5	100.0	0	0	0	0	5	100		
Historic Metals Total												
	38	5.2	483	66.8	163	22.5	39	5.4	723	100		

Table 5. Summary of Historic Glass, Church
 * All final percents rounded to nearest whole

Type	Stratum I		Stratum II		Stratum III		Stratum IV		Strata I-IV	
	#	%	#	%	#	%	#	%	#	%
Venetian										
Clear	4	6.0	21	31.3	37	55.2	5	7.5	67	100
Blue			2	100.0					2	100
Green			4	40.0	5	50.0	1	10.0	10	100
Clear with white latticino			1	33.3	1	33.3	1	33.3	3	100
Heavy patina			2	100.0					2	100
Total	4	4.8	30	35.7	43	51.2	7	8.3	84	100
Other										
Unidentified fragment	1	100.0							1	100
Total	1	100.0							1	100
Historic Glass Total										
	5	5.9	30	35.3	43	50.6	7	8.2	85	100

Table 6. Historic Ceramics, Church, Strata I-IV Totals
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class #	Weight (g)	% Group #	Weight (g)
Maiolica						
Columbia plain	408	3318.7	78.0	85.6	23.2	13.1
Columbia plain green	12	128.6	2.3	3.3	.7	.5
yaval blue on white	9	35.0	1.7	.9	.5	.1
Ligurian blue on blue	61	151.8	11.7	3.9	3.5	.6
Santo Domingo blue on white	8	158.2	1.5	4.1	.5	.6
Montelupo polychrome	10	38.9	1.9	1.0	.6	.1
Isabela polychrome	1	8.0	.2	.2	.1	.1
Faenza white	14	40.0	2.7	1.0	.8	.1
Total	523	3879.2	100	100	29.9	15.2
Cuenca tile						
Cuenca tile	32	2555.2	100.0	100.0	1.8	10.0
Total	32	2555.2	100	100	1.8	10.0
Utilitarian earthenware						
Honey colored/Seville ware	119	1282.3	11.8	9.5	6.8	5.0
Olive jar	366	4465.1	36.3	33.3	20.8	17.6
Green glazed basin	53	3234.6	5.3	24.1	3.0	12.7
El Morro ware	80	688.2	7.9	5.1	4.5	2.7
Feldspar inlaid redware	14	63.6	1.4	.5	.8	.3
Orange micaceous ware	9	53.5	.9	.4	.5	.2
Unglazed redware	85	482.1	8.4	3.6	4.8	1.9

Unglazed earthenware	88	1137.3	8.7	8.5	5.0	4.5
Green glazed ware	35	431.1	3.5	3.2	2.0	1.7
Green glazed lattice	3	2.0	.3	.1	.2	.1
Thin unglazed redware	88	254.0	8.7	1.9	5.0	1.0
Yellow glazed redware	68	1313.5	6.7	9.8	3.9	5.2
Total	1008	13407.3	100	100	57.3	52.9
Other						
Colono ware	143	5356.1	74.9	96.4	8.2	21.1
Rheinish/Cologne stoneware	5	32.0	2.6	.5	.3	.1
Oriental blue on white porcelain	12	25.8	6.3	.5	.7	.1
Kaolin pipe	30	137.7	15.7	2.5	1.7	.5
Red clay pipe	1	2.4	.5	.1	.1	.1
Total	191	5554.0	100	100	11.0	21.9
Historic Ceramics Total						
	1754	25395.7		100	100	

Table 7. Historic Metals, Church, Strata I-IV Totals
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Iron						
Knife	6	353.0	1.3	4.7	.8	4.1
Chisel	2	46.0	.4	.6	.3	.5
Horseshoe	5	692.6	1.1	9.2	.7	8.0
Scissors	1	21.4	.2	.3	.1	.2
Band	10	300.1	2.1	4.0	1.4	3.5
Sword	3	349.9	.6	4.6	.4	4.0
Unidentified fragment	402	2168.4	84.5	28.8	55.6	25.2
Plate	1	26.0	.2	.3	.1	.3
Cotter key hinge	5	244.5	1.1	3.3	.7	2.8
Horse bit	3	367.5	.6	4.9	.4	4.2
Arrow tip	1	6.2	.2	.1	.1	.1
Jew's harp	4	81.9	.8	1.1	.6	.9
Latch	5	396.0	1.1	5.3	.7	4.6
Key	1	51.4	.2	.7	.1	.6
Corner bracket	3	62.5	.6	.8	.4	.7
Lock plate	2	566.7	.4	7.5	.3	6.6
Door hinge	2	112.7	.4	1.5	.3	1.3
Door handle	1	125.1	.2	1.7	.1	1.5
O-ring	6	164.3	1.3	2.2	.8	1.9
Chain	2	15.0	.4	.2	.3	.2
Hoe blade	2	977.9	.4	13.0	.3	11.4
Buckle	1	2.0	.2	.1	.1	.1
Decorative hinge	1	23.8	.2	.3	.1	.3
Rod	2	283.3	.4	3.8	.3	3.3
Kettle	1	10.9	.2	.1	.1	.1
S-link	2	11.6	.4	.1	.3	.1
Bore cleaner	2	59.5	.4	.8	.3	.7
Total	476	7520.2	100	100	65.7	87.2

Copper

Maravedi	159	562.0	82.0	82.7	22.0	6.5
Lace tip	20	8.3	10.3	1.2	2.8	.1
Sheet	13	90.4	6.7	13.3	1.8	1.1
Unidentified fragment	1	1.7	.5	.3	.1	.1
Hawk's bell	1	16.8	.5	2.5	.1	.2
Total	194	679.2	100	100	26.8	8.0

Brass

Straight pin	39	8.0	81.3	2.5	5.4	.1
Scabbard tip	1	7.9	2.1	2.5	.1	.1
Book clasp	2	14.8	4.1	4.7	.3	.2
Unidentified fragment	2	18.5	4.1	5.9	.3	.2
Corner plate	1	13.7	2.1	4.4	.1	.1
Star	1	.8	2.1	.3	.1	.1
Cup	1	197.9	2.1	63.1	.1	2.3
Scabbard top	1	52.1	2.1	16.6	.1	.6
Total	48	313.7	100	100	6.5	3.7

Lead

Unidentified fragment	1	31.7	20.0	33.1	.1	.4
Shot	2	47.5	40.0	49.6	.3	.5
Washer	1	4.8	20.0	5.0	.1	.1
Net weight	1	11.8	20.0	12.3	.1	.1
Total	5	95.8	100	100	.6	1.1
Historic Metals Total						
	723	8608.9		100	100	

Table 8. Historic Glass, Church, Strata I-IV Totals
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Venetian						
Clear	67	88.2	79.7	71.1	78.8	67.7
Blue	2	.6	2.4	.5	2.4	.5
Green	10	26.8	11.9	21.6	11.7	20.6
Clear with white latticino	3	3.6	3.6	2.9	3.5	2.7
Heavy patina	2	4.9	2.4	3.9	2.4	3.8
Total	84	124.1	100	100	98.8	95.3
Other						
Unidentified fragment	1	6.1	100.0	100.0	1.2	4.7
Total	1	6.1	100	100	1.2	4.7
Historic Glass Totals						
	85	130.2			100	100

Table 9. Historic Ceramics, Stratum I, Church
 * All final percents rounded to nearest whole

Type	Stratum I				Strata I-IV					
	#	Weight (g)	% Class		% Group		% Type		% Class	
			Weight (g)	#	Weight (g)	#	Weight (g)	#	Weight (g)	#
Maiolica										
Columbia plain	19	160.0	70.4	82.4	11.1	5.1	4.7	4.8	3.6	4.1
Ligurian blue on blue	6	15.7	22.2	8.1	3.5	.5	9.8	10.3	1.1	.4
Santo Domingo blue on white	1	10.5	3.7	5.4	.6	.3	12.5	6.6	.2	.3
Isabela polychrome	1	8.0	3.7	4.1	.6	.3	100.0	100.0	.2	.2
Total	27	194.2	100	100	15.8	6.2			5.1	5.0
Cuenca tile										
Cuenca tile	3	187.3	100.0	100.0	1.8	6.0	9.4	7.3	9.4	7.3
Total	3	187.3	100	100	1.8	6.0			9.4	7.3
Utilitarian earthenware										
Honey colored/Seville ware	7	60.2	6.9	3.0	4.1	1.9	5.9	4.7	.7	.4
Olive jar	41	638.0	40.2	31.3	24.0	20.4	11.2	14.3	4.0	4.7
Green glazed basin	5	554.3	4.9	27.2	2.9	17.7	9.4	17.1	.5	4.1
Feldspar inlaid redware	1	3.0	1.0	.1	.6	.1	7.1	4.7	.1	.1
Unglazed redware	1	1.1	1.0	.1	.6	.0	1.2	.2	.1	.1
Unglazed earthenware	13	221.2	12.7	10.8	7.6	7.1	14.8	19.5	1.3	1.6
Green glazed ware	3	39.2	2.9	1.9	1.7	1.3	8.6	9.1	.3	.3
Thin unglazed redware	5	33.1	4.9	1.6	2.9	1.1	5.7	13.0	.5	.2
Yellow glazed redware	26	488.8	25.5	24.0	15.2	15.7	38.2	37.2	2.6	3.6

Total	102	2038.9	100	100	59.6	65.3	10.1	15.1
Other								
Colono ware	23	641.3	58.9	91.1	13.4	20.5	16.1	12.0
Rheinish/Cologne stoneware	1	15.0	2.6	2.1	.6	.5	20.0	46.9
Kaolin pipe	14	45.4	35.9	6.5	8.2	1.4	46.7	33.0
Red clay pipe	1	2.4	2.6	.3	.6	.1	100.0	100.0
Total	39	704.1	100	100	22.8	22.5	20.3	12.7
Historic Ceramics Total								
	171	3124.5			100	100		

Table 10. Historic Metals, Stratum I, Church
 * All final percents rounded to nearest whole

Type	Stratum I			Strata I-IV		
	#	Weight (g)	% Class # Weight (g)	% Group # Weight (g)	% Type # Weight (g)	% Class # Weight (g)
Iron						
Chisel	1	24.0	4.8	2.7	2.6	2.5 50.0 52.2 .2 .3
Scissors	1	21.4	4.8	2.4	2.6	2.2 100.0 100.0 .2 .3
Unidentified fragment	15	322.7	71.2	35.8	39.7	33.4 3.7 14.9 3.2 4.3
Plate	1	26.0	4.8	2.9	2.6	2.7 100.0 100.0 .2 .3
Lock plate	1	488.2	4.8	54.2	2.6	50.6 50.0 86.1 .2 6.5
Kettle	1	10.9	4.8	1.2	2.6	1.1 100.0 100.0 .2 .1
S-link	1	7.6	4.8	.8	2.6	.8 50.0 65.5 .2 .1
Total	21	900.8	100	55.3	93.3	4.4 11.9
Copper						
Maravedi	14	47.6	87.4	73.9	36.9	4.9 8.8 8.4 7.2 7.0
Sheet	1	15.1	6.3	23.5	2.6	1.6 7.7 16.6 .6 2.2
Unidentified fragment	1	1.7	6.3	2.6	2.6	.2 100.0 100.0 .6 .2
Total	16	64.4	100	100	42.1	6.7 8.4 9.4
Brass						
Straight pin	1	.1	100.0	100.0	2.6	0.0 2.5 1.2 2.1 .1
Total	1	.1	100	100	2.6	0.0 2.1 .1
Historic Metals Total						
	38	965.3		100	100	

Table 11. Historic Glass, Stratum I, Church
 * All final percents rounded to nearest whole

Type	Stratum I			Strata I-IV		
	#	Weight (g)	% Class # Weight (g)	% Group # Weight (g)	% Type # Weight (g)	% Class # Weight (g)
Venetian						
Clear	4	2.9	100.0	100.0	80.0	32.2 6.0 3.3 4.7 2.3
Total	4	2.9	100	100	80.0	32.2 4.7 2.3
Other						
Unidentified fragment	1	6.1	100.0	100.0	20.0	67.8 100.0 100.0 100.0 100.0
Total	1	6.1	100	100	20.0	67.8 100.0 100.0
Historic Glass Total						
	5	9.0		100	100	

Table 12. Historic Ceramics, Stratum II, Church
 * All final percents rounded to nearest whole

Type	Stratum II				Strata I-IV					
	#	Weight (g)	% Class		% Group		% Type		% Class	
			#	Weight (g)	#	Weight (g)	#	Weight (g)	#	Weight (g)
Maiolica										
Columbia plain	142	1351.5	70.3	85.2	20.3	10.6	34.8	40.7	27.1	34.8
Columbia plain green	8	85.6	3.9	5.4	1.1	.6	66.7	66.5	1.5	2.2
Yayal blue on white	5	13.8	2.5	.8	.7	.1	55.6	39.4	.9	.3
Ligurian blue on blue	35	96.0	17.3	6.1	5.0	.8	57.4	63.2	6.7	2.4
Santo Domingo blue on white	1	1.0	.5	.1	.1	.1	12.5	.6	.2	.1
Montelupo polychrome	3	12.9	1.5	.8	.4	.1	30.0	33.1	.6	.3
Faenza white	8	25.5	4.0	1.6	1.1	.2	57.1	63.8	1.5	.6
Total	202	1586.3	100	100	28.7	12.5			38.5	40.7
Cuenca tile										
Cuenca tile	16	1513.7	100.0	100.0	2.3	11.9	50.0	59.2	50.0	59.2
Total	16	1513.7	100	100	2.3	11.9			50.0	59.2
Utilitarian earthenware										
Honey colored/Seville ware	49	629.5	13.0	10.3	7.0	4.9	41.2	49.1	4.8	4.7
Olive jar	146	1800.2	38.7	29.4	20.9	14.1	39.9	40.3	14.5	13.4
Green glazed basin	35	2098.7	9.3	34.3	5.0	16.4	66.0	64.9	3.5	15.7
El Morro ware	10	87.3	2.6	1.4	1.4	.7	12.5	12.7	1.0	.7
Feldspar inlaid redware	3	11.0	.8	.2	.4	.1	21.4	17.3	.3	.1
Orange micaceous ware	9	53.5	2.4	.8	1.3	.4	100.0	100.0	.9	.4

Unglazed redware	23	198.3	6.1	3.2	3.3	1.5	27.0	41.1	2.3	1.5
Unglazed earthenware	30	268.3	8.0	4.4	4.3	2.1	34.1	23.6	3.0	2.0
Green glazed ware	9	194.1	2.4	3.2	1.3	1.5	25.7	45.0	.9	1.4
Thin unglazed redware	23	71.0	6.1	1.2	3.3	.6	26.1	28.0	2.3	.5
Yellow glazed redware	40	712.3	10.6	11.6	5.7	5.6	58.8	54.2	3.9	5.3
Total	377	6124.2	100	100	53.9	47.9			37.4	45.7
Other										
Colono ware	80	3400.2	76.2	96.7	11.5	26.7	55.9	63.5	41.9	61.2
Rheinish/Cologne stoneware	1	5.2	1.0	.1	.1	.1	20.0	16.2	.5	.1
Oriental blue on white porcelain	8	19.8	7.6	.6	1.1	.2	66.7	76.7	4.2	.4
kaolin pipe	16	92.3	15.2	2.6	2.3	.7	53.3	67.0	8.4	1.7
Total	105	3517.5	100	100	15.0	27.7			55.0	63.4
Historic Ceramics Total										
	700	12741.7			100	100				

Table 13. Historic Metals, Stratum II, Church
 * All final percents rounded to nearest whole

Type	Stratum II			Strata I-IV						
	#	Weight (g)	% Class # Weight (g)	% Group # Weight (g)	% Type # Weight (g)	% Class # Weight (g)				
Iron										
Knife	5	333.4	1.4	7.4	1.0	6.3	83.3	94.4	1.1	4.4
Horseshoe	2	530.5	.6	11.7	.4	10.1	40.0	76.6	.4	7.1
Band	4	124.9	1.1	2.8	.8	2.4	40.0	41.6	.8	1.7
Sword	2	80.6	.6	1.8	.4	1.5	66.7	23.0	.4	1.1
Unidentified fragment	312	1401.9	89.4	31.0	64.6	26.6	77.6	64.6	65.4	18.6
Cotter key hinge	2	106.9	.6	2.4	.4	2.0	40.0	43.7	.4	1.4
Horse bit	1	119.6	.3	2.6	.2	2.3	33.3	32.5	.2	1.6
Jew's-harp	3	73.4	.8	1.6	.6	1.4	75.0	89.6	.6	1.0
Latch	2	309.0	.6	6.8	.4	5.9	40.0	78.0	.4	4.1
Corner bracket	3	62.5	.8	1.4	.6	1.2	100.0	100.0	.6	.8
Door hinge	1	78.5	.3	1.7	.2	1.5	50.0	69.7	.2	1.0
Door handle	1	125.1	.3	2.8	.2	2.4	100.0	100.0	.2	1.7
O-ring	4	125.8	1.1	2.8	.8	2.4	66.7	76.6	.8	1.7
Chain	1	8.1	.3	.2	.2	.1	50.0	54.0	.2	.1
Hoe blade	2	977.9	.6	21.6	.4	18.6	100.0	100.0	.4	13.0
Buckle	1	2.0	.3	1.1	.2	.1	100.0	100.0	.2	.1
Decorative hinge	1	23.8	.3	.5	.2	.4	100.0	100.0	.2	.3
Rod	1	31.2	.3	.7	.2	.6	50.0	11.0	.2	.4
S-link	1	4.0	.3	.1	.2	.1	50.0	34.5	.2	.1
Total	349	4519.1	100	100	72.0	85.9			73.0	60.2
Copper										
Maravedi	93	322.4	85.3	88.4	19.3	6.1	58.5	57.4	47.9	47.5
Lace tip	9	4.1	8.3	1.1	1.9	.1	45.0	49.4	4.6	.6

Table 14. Historic Glass, Stratum II, Church

* All final percents rounded to nearest whole

Type	Stratum II				Strata I-IV					
	#	Weight (g)	% Class		#	% Group		#	% Class	
			Weight (g)	Weight (g)		Weight (g)	Weight (g)		Weight (g)	Weight (g)
Venetian										
Clear	21	17.8	70.0	38.9	70.0	38.9	31.3	20.2	25.0	14.3
Blue	2	.6	6.7	1.3	6.7	1.3	100.0	100.0	2.4	.5
Green	4	22.3	13.3	48.8	13.3	48.8	40.0	83.2	4.7	18.0
Clear with white lattice	1	.1	3.3	.2	3.3	.2	33.3	2.8	1.2	.1
Heavy patina	2	4.9	6.7	10.7	6.7	10.7	100.0	100.0	2.4	3.9
Total	30	45.7	100	100	100.0	100.0			35.7	36.8
Historic Glass Total										
	30	45.7			100		100	100		

* All final percents rounded to nearest whole

Type	Stratum III						Strata I-IV					
	#	Weight (g)	% Class		% Group		#	% Type	Weight (g)	#	% Class	
			#	Weight (g)	#	Weight (g)						#

Green glazed ware	20	173.1	4.1	3.6	2.5	2.1	57.1	40.2	2.0	1.3
Green glazed lattice	3	2.0	.6	.1	.4	.1	100.0	100.0	.3	.1
Thin unglazed redware	55	139.0	11.4	2.9	7.1	1.7	62.5	54.7	5.5	1.0
Yellow glazed redware	2	112.4	.4	2.4	.3	1.4	2.9	8.6	.2	.8
Total	483	4732.4	100	100	62.0	58.3			47.9	35.2
Other										
Colono ware	32	773.4	82.0	97.7	4.1	9.5	22.4	14.4	16.8	13.9
Rheinish/Cologne stoneware	3	11.8	7.7	1.5	.4	.1	60.0	36.9	1.6	.2
Oriental blue on white porcelain	4	6.0	10.3	.8	.5	.1	33.3	23.3	2.1	.1
Total	39	791.2	100	100	5.0	9.7			20.5	14.2
Historic Ceramics Total										
	779	8117.2			100	100				

Table 16. Historic Metals, Stratum III, Church
 * All final percents rounded to nearest whole

Type	Stratum III				Strata I-IV					
	#	Weight (g)	% Class		% Group		% Type			
			#	Weight (g)	#	Weight (g)	#	Weight (g)		
Iron										
Knife	1	19.6	1.1	1.0	.6	.9	16.7	5.6	.3	.2
Chisel	1	22.0	1.1	1.2	.6	1.0	50.0	47.8	.3	.2
Horseshoe	3	162.1	3.4	8.7	1.8	7.9	60.0	23.4	.6	2.2
Band	6	175.2	6.8	9.4	3.7	8.6	60.0	58.4	1.3	2.3
Sword	1	269.3	1.1	14.5	.6	13.2	33.3	77.0	.2	3.6
Unidentified fragment	65	398.8	73.9	21.5	39.9	19.5	16.2	18.4	13.7	5.3
Cotter key hinge	2	118.6	2.3	6.4	1.2	5.8	40.0	48.5	.4	1.6
Horse bit	1	205.6	1.1	11.1	.6	10.1	33.3	55.9	.2	2.7
Arrow tip	1	6.2	1.1	.3	.6	.3	100.0	100.0	.2	.1
Latch	1	25.9	1.1	1.4	.6	1.3	20.0	6.5	.2	.3
Key	1	51.4	1.1	2.8	.6	2.5	100.0	100.0	.2	.7
Lock plate	1	78.5	1.1	4.2	.6	3.8	50.0	13.9	.2	1.0
Door hinge	1	34.2	1.1	1.8	.6	1.7	50.0	30.3	.2	.5
O-ring	2	38.5	2.3	2.1	1.2	1.9	33.3	23.4	.4	.5
Rod	1	252.1	1.1	13.6	.6	12.3	50.0	89.0	.2	3.4
Total	88	1858.0	100	100	53.8	90.8			18.4	24.8
Copper										
Maravedi	40	144.5	75.5	90.6	24.5	7.0	25.2	25.7	20.6	21.3
Lace tip	8	1.7	15.1	1.1	4.9	.1	40.0	20.5	4.1	.3
Sheet	5	13.3	9.4	8.3	3.1	.7	38.5	14.7	2.5	2.0
Total	53	159.5	100	100	32.5	7.8			27.2	23.6

Brass

Straight pin	20	3.3	90.9	12.5	12.3	.2	51.3	41.3	41.7	1.0
Unidentified fragment	1	9.5	4.5	35.8	.6	.5	50.0	51.4	2.1	3.0
Corner plate	1	13.7	4.5	51.7	.6	.7	100.0	100.0	2.1	4.3
Total	22	26.5	100	100	13.5	1.4		45.9	8.3	
Historic Metals Total										
	163	2044.0		100	100					

Table 17. Historic Glass, Stratum III, Church

* All final percents rounded to nearest whole

Type	Stratum III				Strata I-IV			
	#	Weight (g)	% Class #	Weight (g)	% Group #	Weight (g)	% Type #	Weight (g)
Venetian								
Clear	37	63.6	86.1	93.0	86.1	93.0	55.2	72.1
Green	5	2.8	11.6	4.1	11.6	4.1	50.0	10.4
Clear with white lattice	1	2.0	2.3	2.9	2.3	2.9	33.3	55.5
Total	43	68.4	100	100	100.0	100.0		51.2
Historic Glass Total								
	43	68.4			100	100		55.1

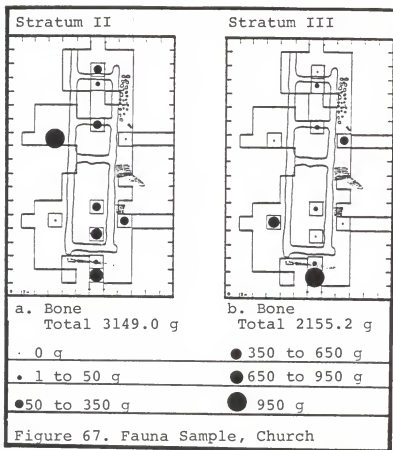
Colono ware	8	541.2	100.0	100.0	7.7	38.3	5.6	10.1	4.2	9.7
Total	8	541.2	100	100	7.7	38.3			4.2	9.7
Historic Ceramics Total										
	104	1412.3			100	100				

Table 19. Historic Metals, Stratum IV, Church
 * All final percents rounded to nearest whole

Type	Stratum IV				Strata I-IV					
	#	Weight (g)	% Class		#	% Group		#	% Class	
			Weight (g)	Weight (g)		Weight (g)	Weight (g)		Weight (g)	Weight (g)
Iron										
Unidentified fragment	10	45.0	55.5	18.6	25.6	13.1	2.5	2.1	2.1	.6
Cotter key hinge	1	19.0	5.6	7.8	2.6	5.5	20.0	7.8	.2	.2
Horse bit	1	42.3	5.6	17.5	2.6	12.3	33.3	11.5	.2	.5
Jew's-harp	1	8.5	5.6	3.5	2.6	2.5	25.0	10.4	.2	.1
Latch	2	61.1	11.1	25.2	5.1	17.8	40.0	15.4	.4	.8
Chain	1	6.9	5.6	2.8	2.5	2.0	50.0	46.0	.2	.1
Bore cleaner	2	59.5	11.1	24.6	5.1	17.4	100.0	100.0	.4	.8
Total	18	242.3	100	100	46.1	70.6			3.7	3.1
Copper										
Maravedi	12	47.5	75.0	52.3	30.8	13.9	7.5	8.5	6.2	7.0
Lace tip	3	2.5	18.8	2.8	7.7	.7	15.0	30.1	1.5	.3
Sheet	1	40.8	6.2	44.9	2.6	11.9	7.7	45.1	.5	6.0
Total	16	90.8	100	100	41.1	26.5			8.2	13.3
Brass										
Straight pin	4	1.6	80.0	16.8	10.3	.5	10.3	20.0	8.3	.5
Scabbard tip	1	7.9	20.0	83.2	2.5	2.3	100.0	100.0	2.1	2.5
Total	5	9.5	100	100	12.8	2.8			10.4	3.0
Historic Metals Total										
	39	342.6			100	100				

Table 20. Historic Glass, Stratum IV, Church
 * All final percents rounded to nearest whole

Type	Stratum IV				Strata I-IV					
	#	Weight (g)	% Class		% Group		% Type			
			#	Weight (g)	#	Weight (g)	#	Weight (g)		
Venetian										
Clear	5	3.9	71.4	54.9	71.4	54.9	7.5	4.4	6.0	3.1
Green	1	1.7	14.3	24.0	14.3	24.0	10.0	6.3	1.2	1.4
Clear with white lattice	1	1.5	14.3	21.1	14.3	21.1	33.3	41.7	1.2	1.2
Total	7	7.1	100	100	100.0	100.0			8.4	5.7
Historic Glass Total										
	7	7.1			100	100				



Fauna Sample: Church

Eleven 2 X 2 m excavation units were subjectively chosen from the 1979 excavation trenches (all of which were taken down to sterile clay). These eleven units represent slightly over 9% of the total one-hundred twenty-two units excavated.

They were chosen from the most faunally productive areas within each room and the immediately adjacent exterior of the church which had produced the most fauna remains (Figure 67). Identification of faunal remains was conducted by Karla Bosworth in the zooarcheological laboratory of the Florida State Museum at Gainesville, Florida.

Table 21 is a listing of the faunal categories excavated by weight, frequency, and stratum. Several tendencies seem apparent: 1) the number of total faunal categories decreases through time from Stratum IV to Stratum II (IV--33, III--19, II--19, and I--8); 2) the number of fish types in Stratum IV is much greater than in any other stratum (IV--16, III--5, II--5, and I--1); 3) the native rodent agouti (Isolobodon portoricensis) appears in Strata III and IV but not in I and II; and, 4) pond turtle (Pseudemys sp.) is utilized heavily throughout the strata (IV--161, III--85, II--504, and I--45).

These figures appear to suggest several trends in faunal utilization at the church. First, soon after contact and conquest a small number of European domestic animals supplanted a wider spectrum of aboriginally utilized native faunal resources. Second, the agouti was eliminated for all practical purposes during the first century of conquest. Third, the pond turtle (Pseudemys sp.) was a staple during all periods at the church. More

Table 21. Fauna Sample

Common Name	Scientific Name	#	Weight
Stratum I			
Unidentified mammal	-	48	44.7
Large mammal	-	44	132.3
Cow	<i>Bos taurus</i>	1	3.1
Pig	<i>Sus scrofa</i>	11	23.2
Sheeplike	<i>Artiodactyl</i>	1	1.6
Pond turtle	<i>Pseudemys</i> sp.	45	61.6
Snook-fish	<i>Centropomus</i> sp.	1	1.2
Unidentified bone	-	151	3.5
Stratum II			
Unidentified mammal	-	414	360.8
Medium mammal	-	22	32.3
Large mammal	-	163	758.7
Human	<i>Homo sapiens</i>	1	1.7
Cow	<i>Bos taurus</i>	16	954.7
Pig	<i>Sus scrofa</i>	26	298.2
Dog	<i>Canis familiaris</i>	1	.4
Unidentified bird	-	2	.2
Chicken	<i>Gallus gallus</i>	1	.4
Duck	<i>Anatidae</i>	1	.7
Unidentified lizard	-	1	.3
Pond turtle	<i>Pseudemys</i> sp.	504	628.3
Unidentified fish	-	24	7.5
Shark	<i>Carcharhinidae</i>	1	.6
Snook	<i>Centropomus</i> sp.	4	3.0
Sleeper gobi	<i>Eleotridae</i>	2	1.4
Grouper-jewfish	<i>Serranidae</i>	1	.1
Crab	-	1	.4
Unidentified bone	-	995	99.4
Stratum III			
Unidentified mammal	-	1273	385.9
Large mammal	-	192	908.8
Cow	<i>Bos taurus</i>	5	381.3
Pig	<i>Sus scrofa</i>	31	225.9
Cat	<i>Felis</i> sp.	1	2.8
Sheeplike	<i>Artiodactyl</i>	13	14.7
Agouti	<i>Isolobodon portoricensis</i>	6	5.1
Horse	<i>Equus</i> sp.	2	25.6
Rodent	<i>Heteropsomys</i>	1	.6

Table 21--continued

Common Name	Scientific Name	#	Weight
Unidentified bird	-	6	3.7
Chicken	Gallus gallus	5	2.7
Pond turtle	Pseudemys sp.	85	142.9
Unidentified fish	-	10	3.8
Snapper	Lutjanus sp.	3	1.8
Grouper	Epinephelus sp.	1	.2
Snook	Centropomus sp.	1	.5
Sleeper gobi	Eleotridae	1	.2
Crab	-	7	.8
Unidentified bone	-	1403	47.9
Stratum IV			
Unidentified mammal	-	109	110.2
Large mammal	-	9	36.0
Small mammal	-	2	1.4
Human	Homo sapiens	1	.9
Cow	Bos taurus	1	6.7
Pig	Sus scrofa	6	30.5
Sheeplike	Artiodactyl	1	7.5
Manatee	Trichechus manatus	1	28.9
Agouti	Isolobodon portoricensis	7	6.6
Unidentified bird	-	12	4.3
Chicken	Gallus gallus	5	11.0
Duck	Aythya sp.	3	1.7
Sea turtle	Chelonidae	1	1.2
Pond turtle	Pseudemys sp.	161	122.6
Iguana	cf. Iguanidae	1	.1
Boa constrictor family	Boid	1	.5
Unidentified fish	-	64	18.4
Shark	Carcharhinidae	8	8.0
Nurse shark	Ginglymostoma cirratum	1	9.0
Snapper	Lutjanus sp.	6	3.0
Grouper	Epinephelus sp.	10	13.1
Parrot fish	Scarus sp.	3	5.0
Snook	Centropomus sp.	6	9.5
Parrot fish	Sparisoma	6	3.4
Porcupine fish	Diodon	2	5.2
Grunt	Haemulon sp.	2	.4
Triggerfish	Balistidae	2	1.0
Hogfish	Labridae	2	.9
Jewfish	Mycteroperca sp.	1	.7

Table 21--continued

Common Name	Scientific Name	#	Weight
Puffer fish	Spheroides sp.	1	.3
Moray eel	Gymnothorax	1	.1
Crab	-	3	2.4
Unidentified bone	-	310	33.1

selective, comparative zooarcheological analysis is needed of tight proveniences from all sectors of Puerto Real before any such apparent tendencies can be stated as fact. This is true especially for the aboriginal and earliest Spanish occupation since it was not possible to separate historic from prehistoric faunal remains in Stratum IV, unlike the other categories of material culture ceramics, metal, and glass. Shell fish were omitted from the sample because of this problem.

One discrete provenience, however, was located within a faunal sample unit. This feature was located in the northwest corner of unit 760N 762E in Stratum II (Figure 100). This feature appears to have been a shallow charcoal-filled hearth/refuse pit used by the post-Spanish period squatters. Table 22 lists the faunal materials recovered from this feature. The faunal material indicates that these squatters dined on pig, chicken, pond turtle, grouper or jewfish, and sea turtle.

In addition to a list of dietary faunal elements associated with the occupation of the church, an effort was made to differentiate the patterns of faunal disposal between the two most well-defined zones of faunal deposition: 1) Stratum III, imperial Spanish; and, 2) Stratum II, the squatter occupation. Total deposition in Stratum III was 2,155.2 g and Stratum II 3,149.0 g (993.8 g or 46% greater than Stratum III). Comparison of the faunal make-up within these strata (Table 21)

Table 22. Faunal Material Excavated from Hearth/Refuse Pit in Unit 760N 762E, Northwest Corner

Common Name	Scientific Name	#	Weight (g)
Unidentified mammal	-	6	4.5
Large mammal	-	6	25.0
Pig	<i>Sus scrofa</i>	1	13.1
Unidentified bird	-	1	0.7
Chicken	<i>Gallus gallus</i>	3	10.8
Turtle	<i>Pseudemys</i> sp.	4	2.3
Unidentified fish	-	2	0.9
Sea turtle	Chelonidae	1	5.3
Grouper-jewfish	Serranidae	1	2.0
Unidentified bone	-	3	1.9

suggests two major changes: 1) an increased deposition of pond turtle (*Pseudemys* sp.) from 142.9 g in Stratum III to 628.3 g in Stratum II; and, 2) an increased deposition of cow, (*Bos taurus*), from 381.3 g in Stratum III to 954.7 g in Stratum II. Although other factors may enter the picture, this sample supports Marrinan's more exhaustive faunal analysis from an exploratory trench at the adjacent masonry tower. In her biomass study she indicates the overwhelming importance of large mammals, primarily cow at 93.33% with 4.59% reptiles (primarily turtle), 1.80% bony fish and shark, and .24% birds composing the rest of the apparent diet (1983:37).

Table 21 illustrates that both strata follow this general pattern. However, as the apparent increased use of cow can be correlated with the increase of the cattle herd size during this time, the apparent dramatic increase

in consumption of pond turtle cannot be so readily explained other than perhaps by skewed sample, change in cultural preference, or increased availability (through increase in turtle population or improvements in capture technology).

The faunal sample was also examined to see if any change in refuse spatial deposition occurred between Strata III and II. This was done by representing faunal weights in each unit by circles with diameters increasing relative to the weight of remains by stratum for the sample units (Figure 67).

Comparing the interior versus exterior deposition within Stratum III, it is apparent that nearly all deposition took place exterior of the church during the formal Spanish occupation. The heaviest deposition occurred in relation to Room 3 to the south and west. The only other concentration occurred east of Room 2.

Figure 67a for Stratum II indicated that although the major deposition occurred exterior to the church, a significant portion was also deposited within the structure. Again, the south end of Room 3 appears to be the locus of heavy interior and exterior deposition. Low deposition occurs on the west side of this room and a moderate amount to the east. Room 2 has reversed its pattern from Stratum III (Figure 67b), showing a heavy deposition to the west, moderate deposition interior, and quite low to the east.

Room 1 indicates low to moderate deposition from interior to exterior, proceeding northward.

These depositional patterns relate to the function of the church in several ways. First, the interior of the structure north of the dry-laid stone feature was kept free of faunal debris during the period of Stratum III deposition. Second, deposition increased within the church during the later squatter period represented by Stratum II. Third, the exterior southern end of Room 3 was a favorite disposal place during both time periods. Fourth, the west and east side of Rooms 2 and 3 reversed their patterns from Stratum III to II.

The function of the church in regard to faunal deposition changed markedly from the imperial Spanish occupation to the squatter occupation. Change in exterior deposition might be explained partially by the semi-demolished state of the structure during the squatter period, altering points of entrance and exit. However, the interior deposition of food remains, along with the associated odor and insects, speaks strongly of a breakdown in the cultural rules that mandated energy expenditure to keep the interior free of trash.

The rate of faunal deposition within each layer can be estimated for the church by bracketing Stratum III between 1510-1578 (68 years) and Stratum II at 1578-1605 (27 years). During the estimated sixty-eight years of active imperial Spanish occupation of the church building,

2,155.2 g of faunal remains were deposited, at the rate of 31.69 g per year. During the estimated twenty-seven years of squatter occupation (analysis of the datable material assemblage appears to be primarily 16th-century Iberian in nature) some 3,149.0 g were deposited at the rate of 116.6 g per year. Thus the estimated rate of faunal deposition associated with the church for Stratum II is over 3.6 times as rapid as that computed for Stratum III. This suggests a significant change in social behavior relative to the established pattern of trash disposal at the church within the central sector of an imperially designed and governed New World grid town.

CHAPTER VII
ADDITIONAL ARCHITECTURAL STRUCTURES EXCAVATED

Pre-Church: Circular Structure and Palisade

The historical cultural sequence of the church site is examined in this chapter. First to be discussed is the earliest historic component represented by Stratum IV (this stratum also contained prehistoric Indian materials dating one-thousand years before Spanish contact). Two distinct features are associated with this stratum. First is a linear configuration of shallow post holes running parallel to the north-south axis of the church. This alignment plus the fact that historic artifacts were recovered from several of these post holes and the church's foundation cuts through this feature indicate it is historic in nature but pre-dates the church (Figure 68). These post holes are contained within a shallow, dark grey midden-filled trench approximately 10 to 15 cm deep and 20 to 30 cm wide. The post molds averaged 10 to 15 cm diameter and 30 to 35 cm deep (Figure 70). Examination of the fill from thirty-three of these posts produced one Columbia plain sherd weighing 3 g, one unidentified iron fragment weighing 9.5 g, and .8 g of fine white plaster. This dearth of historic materials indicates its early erection and removal prior to any significant build-up of historic midden in the area.

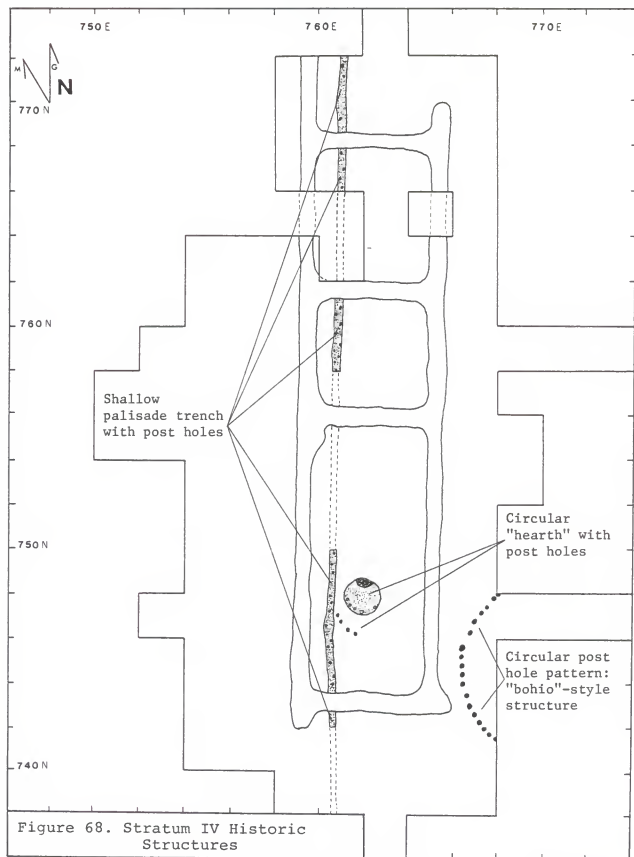


Figure 69. Pre-Church Circular Pole
Structure

Figure 70. Pre-Church Palisade



The function of this feature appears to be that of an early fence/palisade possibly associated with the initial implementation of a "beachhead" colonial settlement at Puerto Real in 1503. The somewhat staggered alignment of many of these post molds suggests the interweaving of horizontal members. This would have added greatly to its strength. As a fence/palisade it could have served several functions: 1) contained and protected the initial domestic mammal breeding stock; 2) provided a physical barrier between the European and Indian population; and, 3) provided a psychological crutch of establishing order and security in a strange environment.

The second major feature contained in this stratum is that of an apparently circular pole structure located 6 m east of the fence/palisade and less than .5 m east of the church (Figures 68 and 69). The configuration of these post holes seems to indicate a circular Indian bohio; however, examination of the fill from these seventeen post holes showed historic materials in ten of them, indicating a post-1503 context (Table 23).

Examination of the Stratum IV materials from the four and one-half units excavated within the interior of the structure presents a small but definite 16th-century assemblage (Table 24).

An interesting feature occurred in units 744N 766E and 746N 766E. Here, directly overlaying these post holes, was a dark grey deposit of Indian midden. At first this

Table 23. Circular Pole Structure Post Holes

Excavation Unit	Posthole Number	Type	#	Weight (g)
746N 766E	1	Brick	1	1,340.0
	2	Mortar	-	28.4
	3	Brass pin	1	0.1
	4	Brick	4	1,827.3
	4	Mortar	-	40.2
	5	Clear Venetian glass	1	0.5
	7	Plaster	-	2.4
	7	Olive jar	1	10.6
744N 766E	7	Plaster	-	1.7
742N 766E	3	Unglazed earthenware	1	1.5
	3	Cut stone fragment	1	71.7
740N 766E	2	Unidentified iron	1	9.1
	2	Slag	-	1.6
	4	Plaster	-	1.2

appeared to be a rather confusing situation. How could an eight-hundred-to-one-thousand-year-old deposit of Indian midden overlay a four-hundred-eighty-year-old historic structure?

The answer came from excavation units 10 m to the north in units 758N 768E and 758N 770E. Here, the Spanish material lay directly on top of the reddish-yellow clayey sand substratum with no Indian midden present (see profile, Figure 46). However, once the Spanish material was removed, several 20 to 45 cm deep, 10 to 15 cm diameter post holes were excavated, filled with dark grey Indian midden with no historic material.

Table 24. Artifacts from Circular Pole Structure Stratum IV (Interior Excavation Units)

* All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	1	7.1	16.7	61.7	9.1	29.0
Ligurian blue on blue	2	.6	33.3	5.2	18.2	2.4
Montelupo polychrome	3	3.8	50.0	33.1	27.3	15.5
Total	6	11.5	100	100	54.6	46.9
Historic Ceramics: Utilitarian earthenware						
Olive jar	1	7.5	20.0	57.7	9.1	30.6
Unglazed earthenware	4	5.5	80.0	42.3	36.3	22.5
Total	5	13.0	100	100	45.4	53.1
Historic Ceramics Total						
	11	24.5			100	100
Historic Metals: Iron						
Unidentified fragment	1	3.1	33.3	16.8	25.0	16.7
Jew's-harp	1	8.5	33.3	45.9	25.0	45.7
Chain	1	6.9	33.3	37.3	25.0	37.1
Total	3	18.5	100	100	75.0	99.5

Historic Metals: Brass

Straight pin	1	.1	100.0	100.0	25.0	.5
Total	1	.1	100	100	25.0	.5
Historic Metals Total						
	4	18.6		100		100
Historic Glass: Venetian						
Clear	1	1.5	100.0	100.0	100.0	100.0
Total	1	1.5	100	100	100.0	100.0
Historic Glass Total						
	1	1.5		100		100

What appears to have occurred is that during either the preparation of the site (or landscaping and drainage) for construction of the church, the Indian midden in the northern and higher portion of the building site was stripped down to culturally sterile soil. Next a thin layer of tan sand was laid down to serve as bedding for the dry-laid brick pavement. The midden was redeposited on the southern and lower area overlaying the now removed circular post structure. Such leveling and filling activities are well-documented for Spanish colonial architecture (Kubler 1948:177).

Additional support for the circular structure pre-dating the church is that over 40% of the patterned post holes contained no historic materials. Had this structure been concurrent with or post-dated the church, we would expect a much higher percentage of post holes to contain historic material, due to the intense deposition of material cultural remains and architectural debris in both Strata III and II. The post holes were of significant size and regularity, averaging 30+ cm in diameter and 35 to 40 cm deep. All evidence indicates that they were dug during the earliest portion of the Spanish occupation at Puerto Real. This structure represented the initial "beachhead" colonization efforts and is associated with the fence/palisade.

Of particular note is the circular configuration of this structure. Since normal European-Spanish

construction practices favor rectangular configuration of living spaces, the circular nature of this structure indicates its influence by Indians on the Spaniards, using native materials and techniques fashioned after the traditional circular Indian bohio of Hispaniola. It may also reflect the Spaniards' adaptation to the constraints of this frontier setting and their early exploitation of the most valuable natural resource on Hispaniola, aboriginal manpower. Sauer (1969:63) describes the circular Indian house, or bohio as follows:

The Arawak house then would have had these features: It was circular in outline and bellshaped in profile. This would indicate that roof and sides were one, not a conical roof that rested on a separate wall. The large size required the setting of upright posts and poles at short intervals, the longer converging in a peak, formed and held by lashings of strong, supple woody vines (bejucos), which are still thus used. The tip of the roof was protected by what Columbus called a chimney, and Las Casas called a coromilla, perhaps a pottery vessel. The cross members of the frame were thin pieces of wood, according to Las Casas; in Oviedo's terms, laths (latas). . . . The high roof provided storage room in depth, including a place to keep the remains of ancestors.

Although the average house size is not recorded, Peter Martyr reported a cacique's house near Cap Haitien as "thirty two long steps in diameter, surrounded by thirty ordinary houses" (Sauer 1969:63). Such a structure has an approximately 20 to 30 m diameter while the structure excavated has an extrapolated diameter of 10 m. The size differential is somewhat misleading; although the diameter is only three times as great, the enclosed area is nearly ten times (706 m^2) that of the excavated structure (78 m^2).

This first Spanish colonial structure was circular in floorplan and probably exhibited a horizontally cross-woven wall of lathing strips with a long grass or thatch roof. These last two aboriginally developed architectural elements can still be found today in rural Haitian architecture (Figure 41c). They combine to produce a structure of low cost that is durable and eminently suited to its environment whether of circular or rectangular configuration.

Reinforcement for reconstruction of a primary Spanish "beachhead" at the site comes from an excerpt from the imperial Spanish town planning ordinances formalized by Philip II in 1573:

Having made the plan of the town and having distributed building lots, each of the settlers shall set up his tent on his plot if he should have one. For this purpose the captains should persuade settlers to carry them, and those who did not bring one should make their huts of easily available local materials, so that they may have shelter, and everyone as soon as possible shall make a palisade or ditch encircling the plaza so that they may not be harmed by Indians or natives. (Crouch, Garr, and Mundigo 1982:16)

This ordinance not only supports the archeological interpretation of the circular Spanish structure and grid-aligned palisade, but it also reinforces the notion that the first action taken at the site was to physically lay out and subdivide the town according to the status and function inherent in the design of a grid town. This allows the inference that not only did this structure occupy the same spatial position as the church, but it

also served a similar although probably more generalized function (i.e., the combination of religious and governmental function). This generalized function might have continued until separate, permanent structures could be completed.

The interplay of central sector architectural elements is also spelled out in the above cited ordinances which stress that governmental and military structures be built near religious structures so that they are "located in such a manner that in times of need the one may aid the other" (Crouch, Garr, and Mundigo 1982:15).

One final feature, possibly associated with this early "beachhead" period is a shallow (20 to 25 cm deep) circular pit located in Stratum IV between the linear palisade feature and the circular structure (Figure 68). Associated with this pit are two semicircles of shallow post holes. Only one historic artifact, an iron nail, was recovered. It came from a post hole within the inner semicircle. The function of the pit is unknown, although a dark grey charcoal stain appearing on its northern border suggests use as some form of hearth; function of the surrounding posts is not apparent.

Major Exterior Post Holes Associated with the Church

A series of large post holes, aligned in a regular east to west pattern was excavated east of the church, all resembling one another. Figure 71 shows the location of

these post holes while Figure 16a illustrates their typical profile, all first delineated at the interface of Strata II and III. First, a massive hole of about 50 cm in diameter was dug 70 to 80 cm below Stratum III ground level into the clay substrata. Next, a post of about 20 to 25 cm in diameter was inserted. Historic artifacts were found in all of these post holes, primarily building material debris; however, the southwest post hole produced a complete copper hawk's bell weighing 22.3 g and measuring 26.5 mm high and 33.4 mm wide (Figure 16d). Of note is the regular, linear alignment of these post holes perpendicular to the church on its eastern side and south of the dry-laid stone platform.

The structure that these post holes suggest is a substantial, rectangular pole building at least 8 m east-west by 12 m north-south covering the area of dry-laid brick paving (Figures 16e, f, and 71). If this is the case, a central third line of posts is probably located under the unexcavated area midway between these two lines. The presence of an angular brick pathway leading from the southern end of the stone platform to the center of this postulated covered area also suggests such an arrangement (Figures 16c and 71). This would provide a covered, paved, open-air addition to the church opposite the side that faces the cemetery. The roof of this structure was probably thatch since little indication of roof tile is shown on the test pit roof tile distribution map (Figure 76).

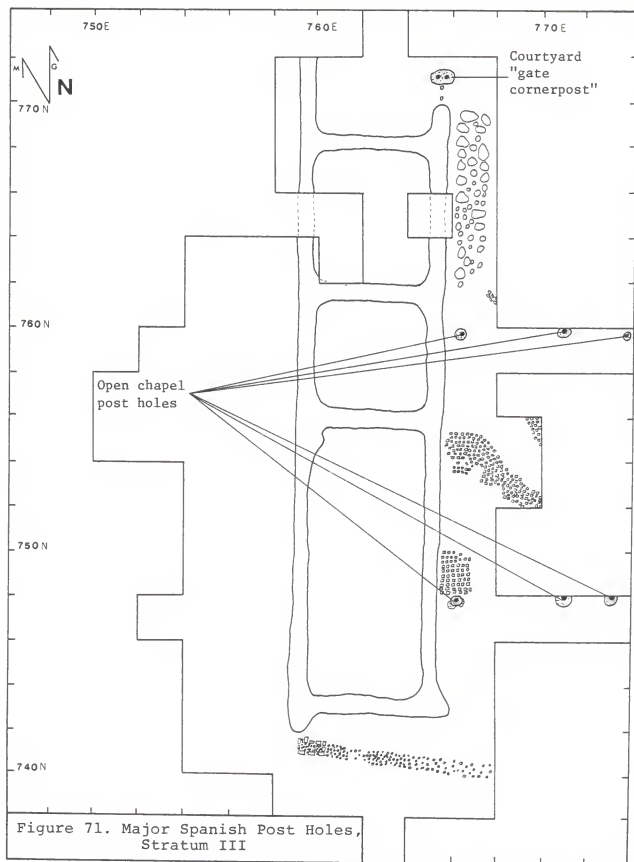


Figure 71. Major Spanish Post Holes,
Stratum III

A post hole just 2 m north of the northeastern buttress of the church measures 80 cm east-west diameter by 60 cm north-south diameter by 80 cm below Stratum III ground surface and contains two post molds 20 to 25 cm in diameter. Materials excavated from this post hole are listed in Table 25.

Table 25. Artifacts from Large Post Hole 2 m North of Church's Northeast Buttress

Type	Number	Weight (g)
Columbia plain	2	20.0
Cuenca tile	1	29.9
Honey colored/Seville ware	3	7.0
Olive jar	2	6.5
Green glazed basin	1	5.7
El Morro ware	5	28.0
Copper lace tip	1	.1
Brass straight pin	1	.1
Brass buckle	1	.1
Clear Venetian glass	4	1.0

This was the largest amount of artifacts from any excavated post hole. Five smaller post holes containing Spanish material were excavated in the same 2-m-square unit. Their location is within one of the highest density artifact areas excavated at the church (Figure 94). These post holes were first delineated at the interface between Strata II and III.

Function of the major post hole can be postulated by noting the two smaller post holes which align it with

the buttress foundation (Figure 71). This alignment suggests a short wooden fence or wall. As shown in Figure 39, the southern courtyard wall can be extended until it intersects the alignment of the church's east wall. A 1.5 to 2 m gap is left between the masonry courtyard wall and the post/fence configuration, suggesting a gateway into the walled courtyard of the church; the post probably supported the hinged end of a wooden gate.

Foundation Robber's Trench

This feature represents the final phase of major human activity at the church (until these excavations) (Figure 46). It is related to the removal of the standing masonry wall ruins by the French in 1787 for their use in construction at the nearby Habitation Destouches. Little material of this later time period was present (Table 26). Three sherds of French faience and a kaolin pipe fragment were found. The remaining materials represent an admixture of Strata II and III, resulting from this activity. That little French-period material is present illustrates the low-status, work-gang nature of labor employed during this salvage operation. Occupation of the site did not occur, only intense, goal-directed activities related to salvage.

Table 26. Artifacts from Church Foundation Trench
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	7	38.2	53.8	60.9	12.7	4.5
Yayal blue on white	2	18.1	15.4	28.9	3.6	2.1
Ligurian blue on blue	2	2.9	15.4	4.6	3.6	.3
Faenza white	2	3.5	15.4	5.6	3.6	.4
Total	13	62.7	100	100	23.5	7.3
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	6	51.0	28.6	24.4	10.9	6.0
Olive jar	8	45.7	38.1	21.8	14.5	5.4
Green glazed basin	2	92.4	9.5	44.2	3.6	10.9
Feldspar inlaid redware	1	7.1	4.7	3.4	1.8	.8
Unglazed earthenware	3	11.8	14.3	5.6	5.5	1.4
Unglazed redware	1	1.2	4.7	.6	1.8	.1
Total	21	209.2	100	100	38.1	24.6
Historic Ceramics: Other						
Colono ware	17	567.6	80.9	97.9	30.9	66.7
French faience	3	5.1	14.3	.9	5.5	.6
Kaolin pipe	1	6.8	4.8	1.2	1.8	.8
Total	21	579.5	100	100	38.2	68.1

Historic Ceramics Total

	55	851.4	100	100
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Historic Metals: Iron

Band	4	120.3	40.0	51.1	17.4	43.0
Unidentified fragment	5	101.0	50.0	42.9	21.7	36.1
Chain	1	14.3	10.0	6.0	4.3	5.1

Total	10	235.6	100	100	43.4	84.2
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Historic Metals: Copper

Maravedi	10	37.0	90.9	84.1	43.5	13.2
Sheet	1	7.0	9.1	15.9	4.3	2.5
Total	11	44.0	100	100	47.8	15.7

Historic Metals: Brass

Straight pin	2	.2	100.0	100.0	8.7	.1
Total	2	.2	100	100	8.7	.1

Historic Metals Total

	23	279.8	100	100
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Historic Glass: Venetian

Clear	5	2.6	100.0	100.0	100.0	100.0
	5	2.6	100	100	100.0	100.0

Historic Glass Total

	5	2.6	100	100	100	100
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CHAPTER VIII MACRO SPATIAL ANALYSIS

Central Sector Test Pit Grid

In an effort to help define the context of the church within the central building complex at Puerto Real an intensive gridwork of shallow (20 cm deep) test pits, each measuring 50 X 50 cm were dug on a 5 m interval. A total of three-hundred ninety-two such tests were completed in this 80 X 100 m area. The 20 cm depth of these tests was chosen in an effort to do as little damage to the site as possible, yet provide an adequate amount of information from a close interval systematic surface collection. This upper 20 cm of the site has been subject periodically to minor disturbance by local hoe agriculture. Discounting the French dismantling of standing masonry walls in the 18th century, this is the only known disturbance to the site. The undisturbed nature of this site is indicated by the fact that less than 1% by weight or number of the recovered artifacts were post-16th century. Tables 27, 28, and 29 list the historic material assemblage from these test pits.

The primary method of spatial analysis of material excavated from these tests, as with the church material, is that of artifact-density contour maps, computer-generated

through the use of standard SYMAP procedures (Dougenik and Sheehan 1979). These SYMAPS were then reduced and redrafted in standard graphic format.

Discussion of the material is presented in two sections: architectural materials and non-architectural artifacts. All of the density contour maps are presented on a common basemap of known architectural and cultural features (Figures 73 to 92).

The major such feature is Building A, the church. Six meters to the northwest is Building B, the tower, and its adjoining arrangement of post holes. This line of post holes is shown intersecting the cemetery area demarcated by dot density graphics compiled from test pits identified in the field as containing human skeletal material. Jennifer Hamilton's transect tests in 1980 revealed the continuation of this cemetery some 20 m further west of the grid test boundary shown here (Hamilton 1982:22). That this area does represent a continued-use cemetery has been substantiated by Dr. William Hodges' test excavation of sequential human burials in a 2 X 3 m unit (shown as a black rectangle) in 1980 and discussed in Chapter IV.

A dry-laid brick pavement is shown on the basemap. It is located 30 m east of the southern end of the church along the 740N line. The pavement was uncovered in two adjacent test pits which provide data for extrapolating the total area (Figure 72e).

Table 27. Historic Ceramics, Central Grid Test Pits
 * All final percents rounded to nearest whole

Type	#	Weight (g)	#	% Class Weight (g)	#	% Group Weight (g)
Maiolica						
Columbia plain	382	1972.4	83.6	87.4	29.3	16.5
Columbia plain green	15	73.7	3.3	3.3	1.1	.6
Columbia plain gunmetal	12	30.5	2.6	1.3	.9	.2
Yaval blue on white	3	6.3	.7	.3	.2	.1
Ligurian blue on blue	16	22.1	3.5	1.0	1.2	.2
Santo Domingo blue on white	4	21.9	.9	1.0	.3	.2
Caparra blue	11	36.3	2.4	1.6	.8	.3
Montelupo polychrome	4	21.2	.9	.9	.3	.2
Montelupo blue on white	2	40.5	.4	1.8	.2	.3
Isabela polychrome	1	20.8	.2	.9	.1	.2
Faenza white	7	12.0	1.5	.5	.5	.1
Total	457	2257.7	100	100	34.9	18.9
Cuenca tile						
Cuenca tile	3	202.1	100.0	100.0	.2	1.7
Total	3	202.1	100	100	.2	1.7
Utilitarian earthenware						
Honey colored/Seville ware	156	1189.7	21.6	15.0	12.0	9.9
Olive jar	357	2775.0	49.3	35.0	27.4	23.2
Green glazed basin	43	2534.3	5.9	31.9	3.3	21.2
El Morro ware	34	170.9	4.7	2.2	2.6	1.4
Feldspar inlaid redware	6	20.6	.8	.3	.5	.2

Orange micaceous ware	14	38.7	1.9	.5	1.1	.3
Unglazed redware	38	527.1	5.2	6.6	2.9	4.4
Unglazed earthenware	64	482.3	8.9	6.1	4.9	4.0
Green glazed ware	12	192.2	1.7	2.4	.9	1.6
Total	724	7930.8	100	100	55.6	66.2
Other						
Colono ware	109	1548.8	92.3	98.2	8.4	12.9
French faience	2	9.8	1.7	.6	.2	.1
Oriental blue on white porcelain	3	8.6	2.6	.5	.2	.1
Kaolin pipe	3	9.4	2.6	.6	.2	.1
French white porcelain	1	.8	.8	.1	.1	.1
Total	118	1577.4	100	100	9.1	13.3
Historic Ceramics Total						
	1302	11968.0			100	100

Table 28. Historic Metals, Central Grid Test Pits
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Iron						
Knife	7	210.8	11.6	15.8	8.0	14.6
Chisel	2	126.1	3.3	9.4	2.3	8.7
Scissors	1	7.1	1.7	.5	1.1	.5
Sword T-guard	1	57.3	1.7	4.3	1.1	4.0
Band	1	19.5	1.7	1.5	1.1	1.3
Sword	1	592.4	1.7	44.4	1.1	41.0
Unidentified fragment	43	289.2	71.6	21.7	48.9	20.0
Plate	1	5.1	1.7	.4	1.1	.3
Cotter key hinge	1	4.0	1.7	.3	1.1	.3
Ornamental clip	2	22.3	3.3	1.7	2.3	1.5
Total	60	1333.8	100	100	68.1	92.2
Copper						
Maravedi	9	28.0	47.4	69.8	10.3	1.9
Lace tip	2	.9	10.5	2.2	2.3	.1
Sheet	3	4.8	15.7	12.0	3.4	.3
Unidentified fragment	1	1.4	5.3	3.5	1.1	.1
Hawk's bell	4	5.0	21.1	12.5	4.6	.3
Total	19	40.1	100	100	21.7	2.7

Brass

Straight pin	2	.2	25.0	.3	2.3	.1
Book clasp	2	45.6	25.0	72.2	2.3	3.1
Ornament	2	12.6	25.0	19.9	2.3	.9
Unidentified fragment	1	2.4	12.5	3.8	1.1	.2
Buckle	1	2.4	12.5	3.8	1.1	.2
Total	8	63.2	100	100	9.1	4.5

Lead

Unidentified fragment	1	9.0	100.0	100.0	1.1	.6
Total	1	9.0	100	100	1.1	.6
Historic Metals Total						
	88	1446.1			100	100

Table 29. Historic Glass, Central Grid Test Pits
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Venetian						
Clear	20	28.0	52.6	70.7	45.5	53.0
Blue	3	1.7	7.9	4.3	6.8	3.2
Green	9	7.0	23.7	17.7	20.5	13.2
Clear with white latticino	4	.8	10.5	2.0	9.1	1.4
Opaque red	2	2.1	5.3	5.3	4.5	4.0
Total	38	39.6	100	100	86.4	74.8
Other						
Chevron bead	1	.1	16.7	.7	2.3	.1
Unidentified bead	3	.1	50.0	.7	6.8	.1
Thick black glass	2	13.2	33.3	98.6	4.5	25.0
Total	6	13.4	100	100	13.6	25.2
Historic Glass Total						
	44	53.0			100	100

Figure 72. Central Sector Test Pit Grid Excavations

- a. Test pits over cemetery (burial excavation under tin roof)
- b. Rapier (106 cm long) from test pit north of tower
- c. Test pits over postulated market area
- d. Rapier (70 cm long) excavated from south exterior of church
- e. Dry-laid brick pavement on eastern border of "market"
- f. Honey colored/Seville ware pitcher from test pit 5 m south of dry-laid brick pavement shown above



a.



b.



c.



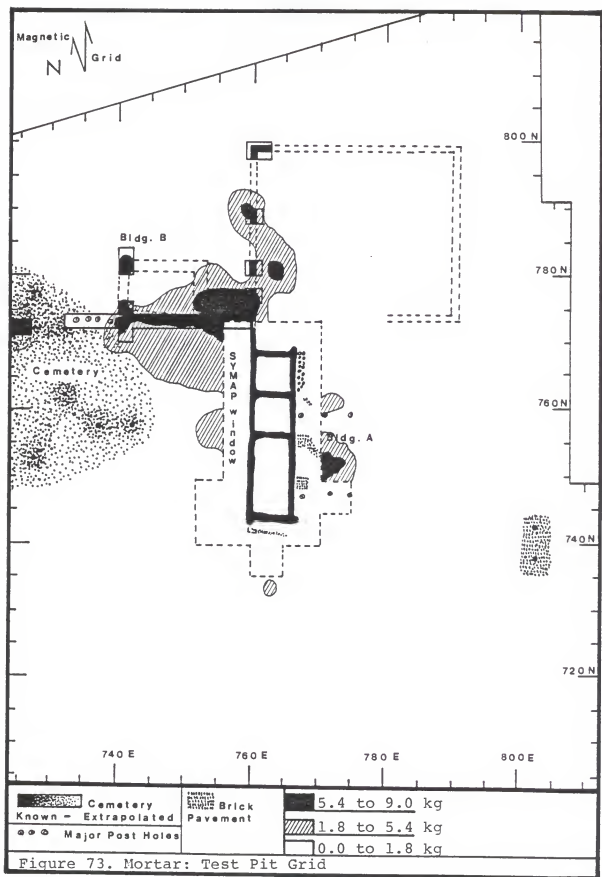
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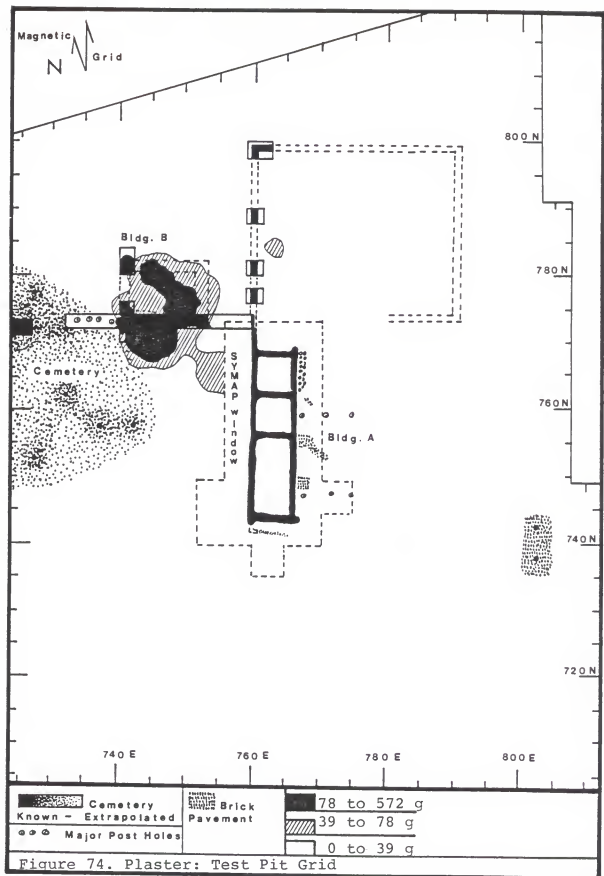


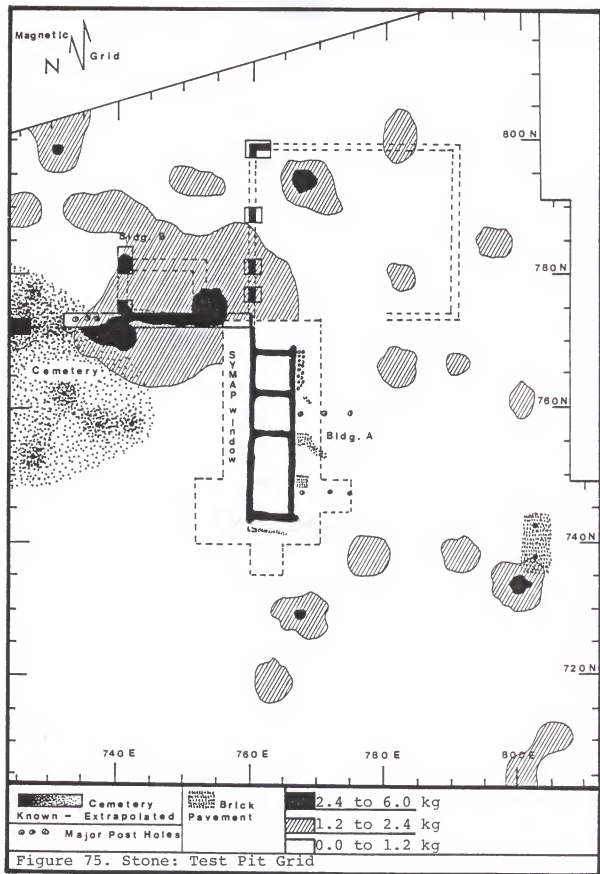
e.

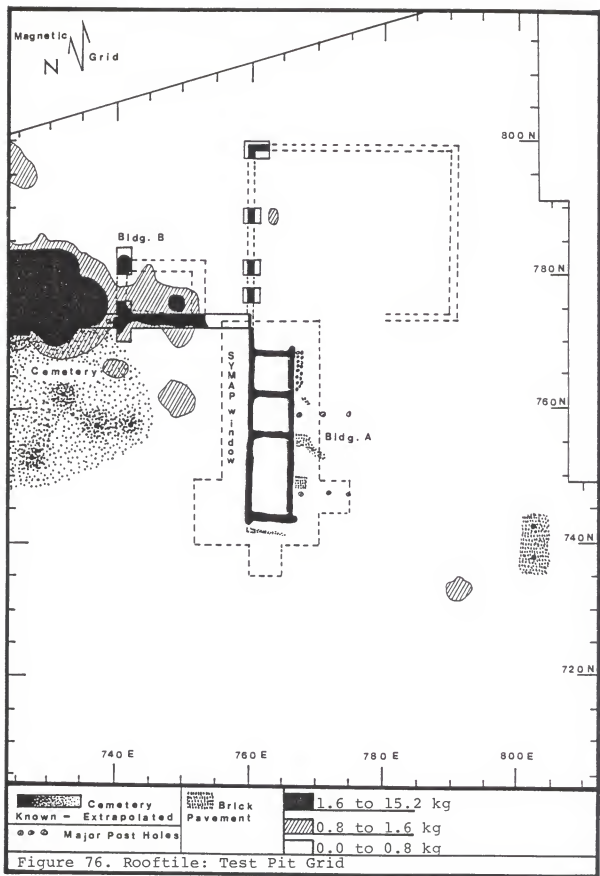


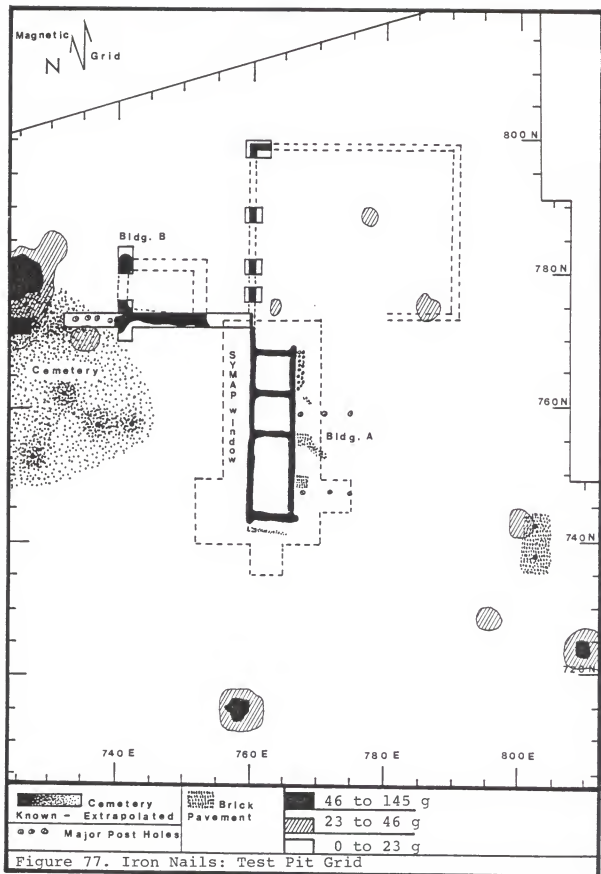
f.











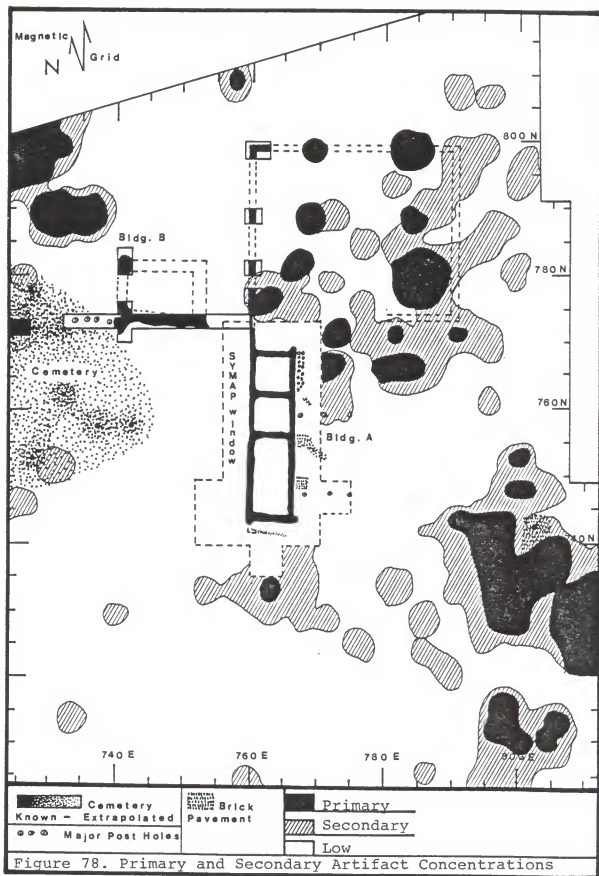
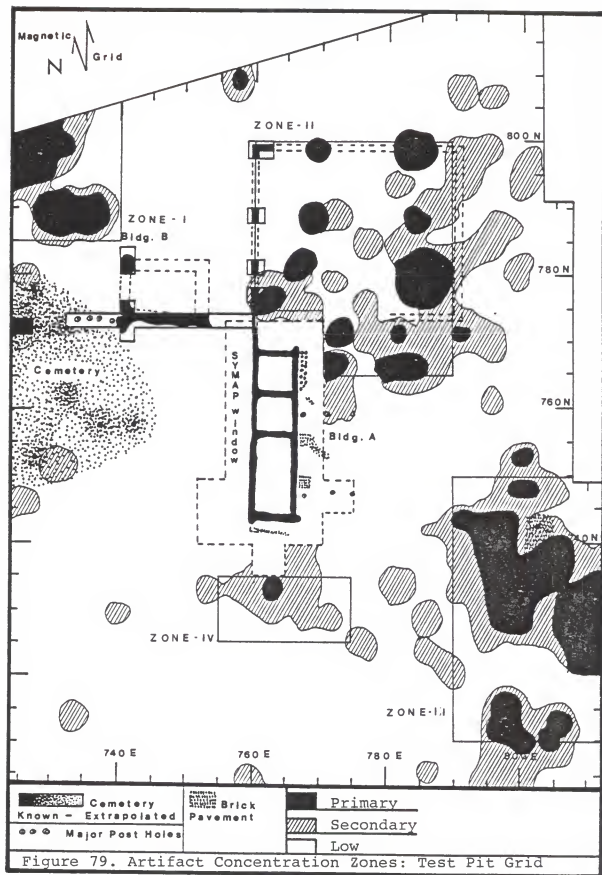
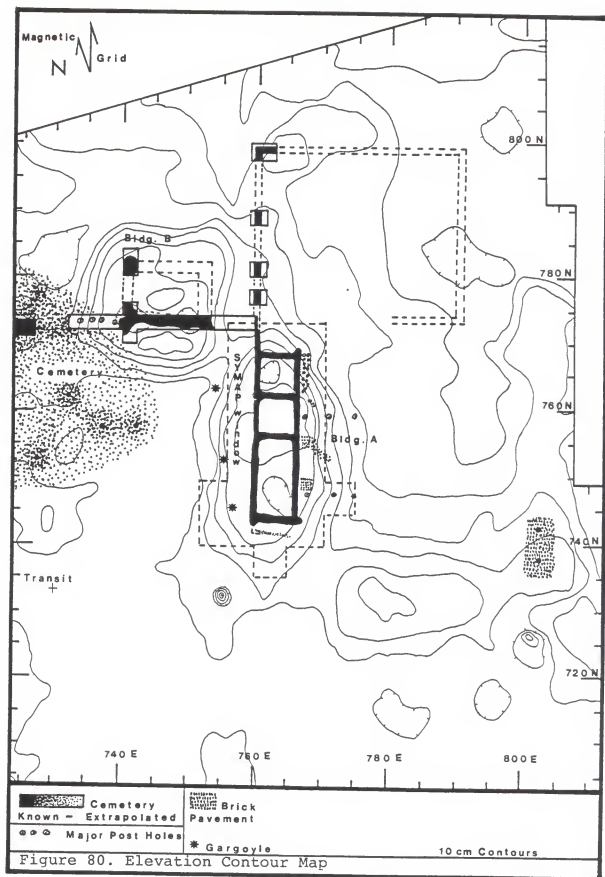
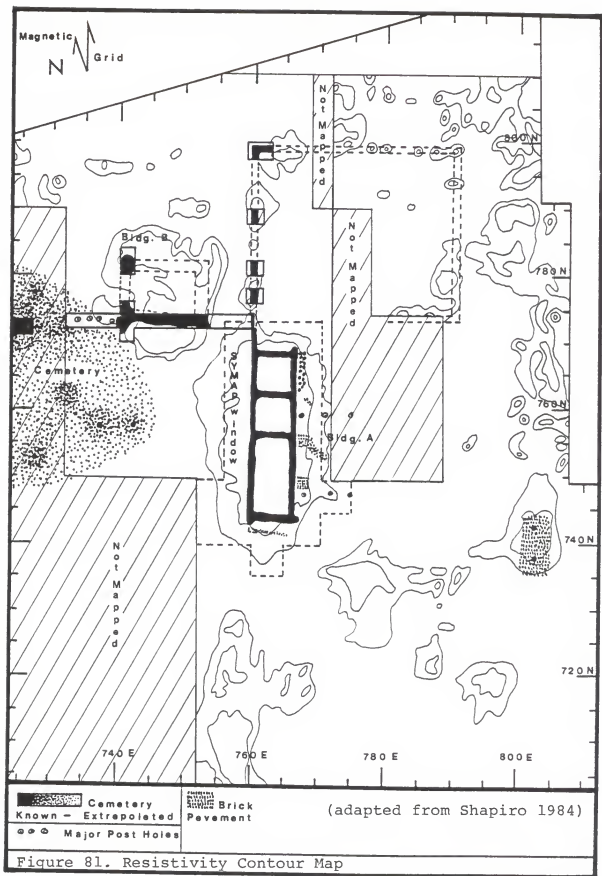
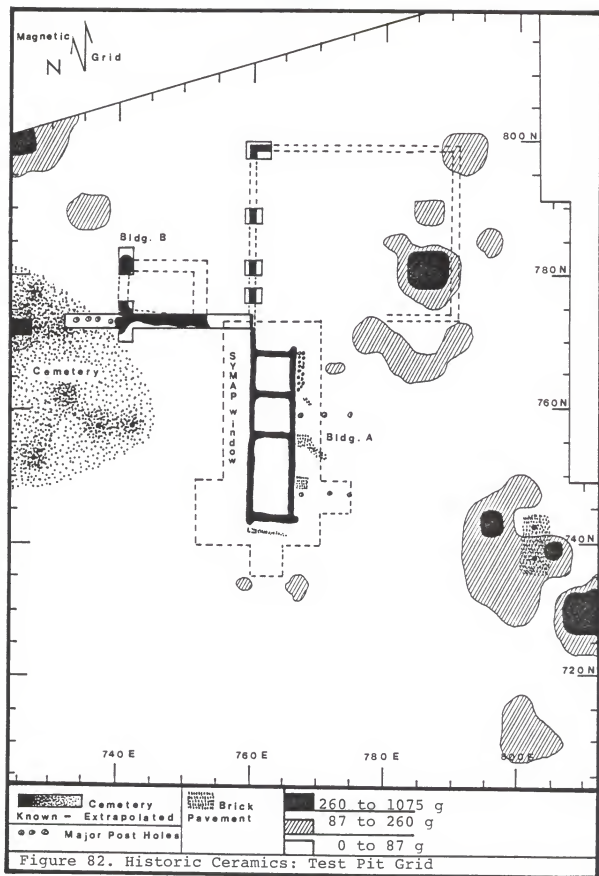


Figure 78. Primary and Secondary Artifact Concentrations

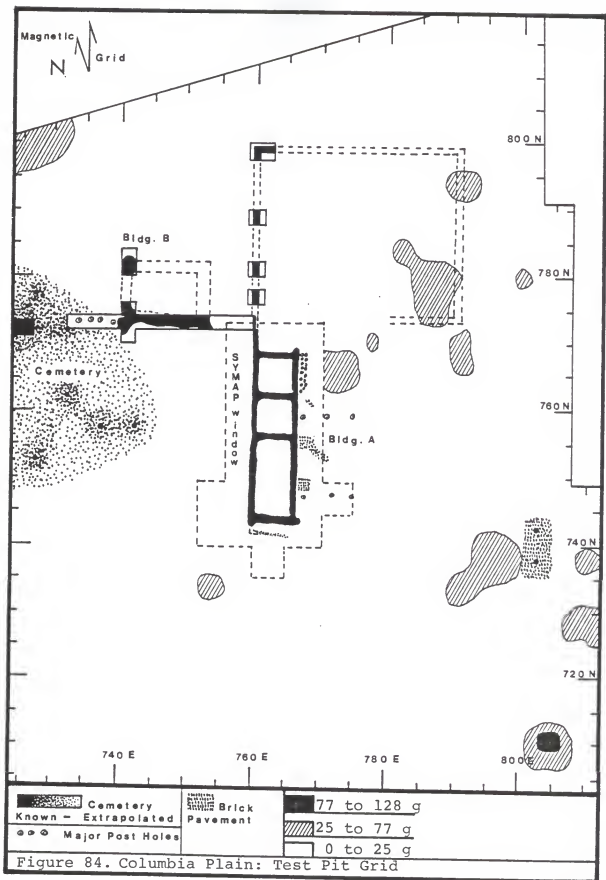


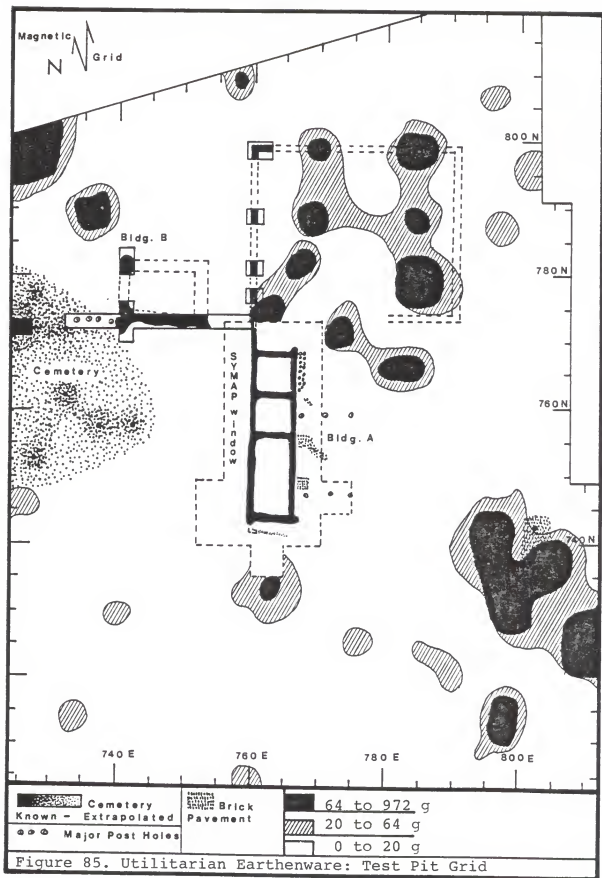


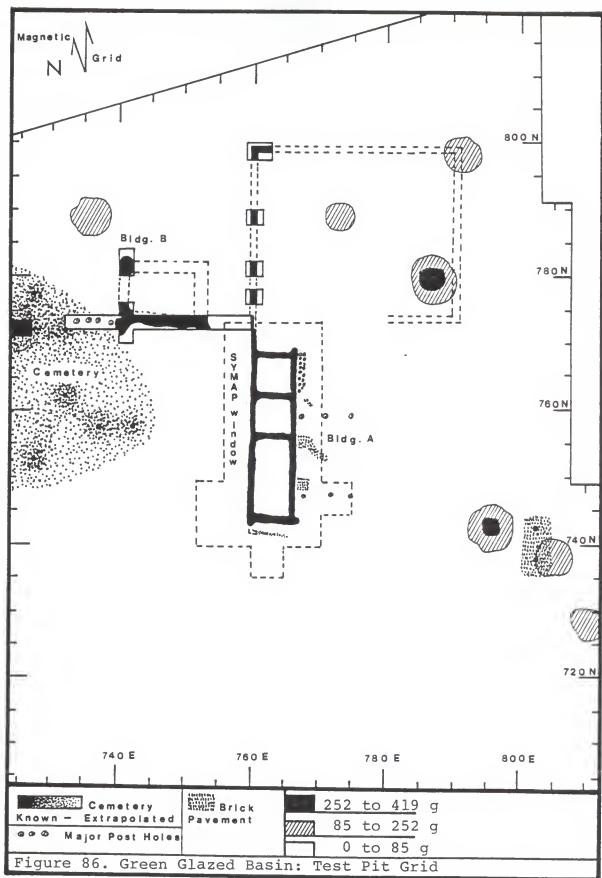


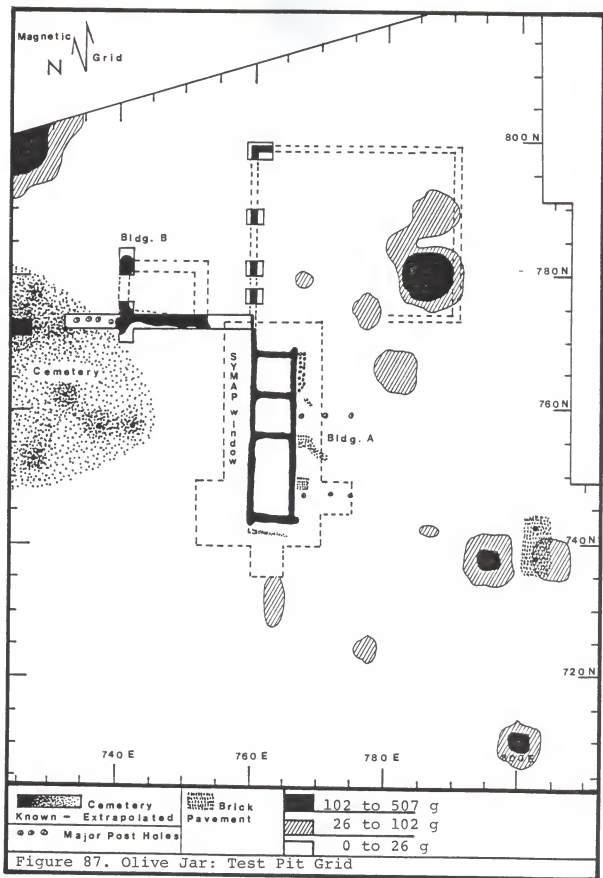


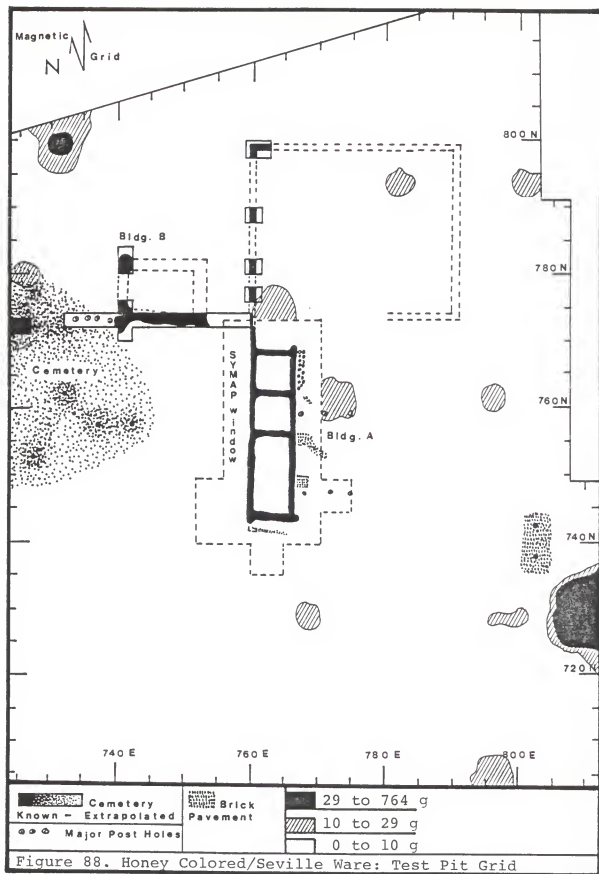


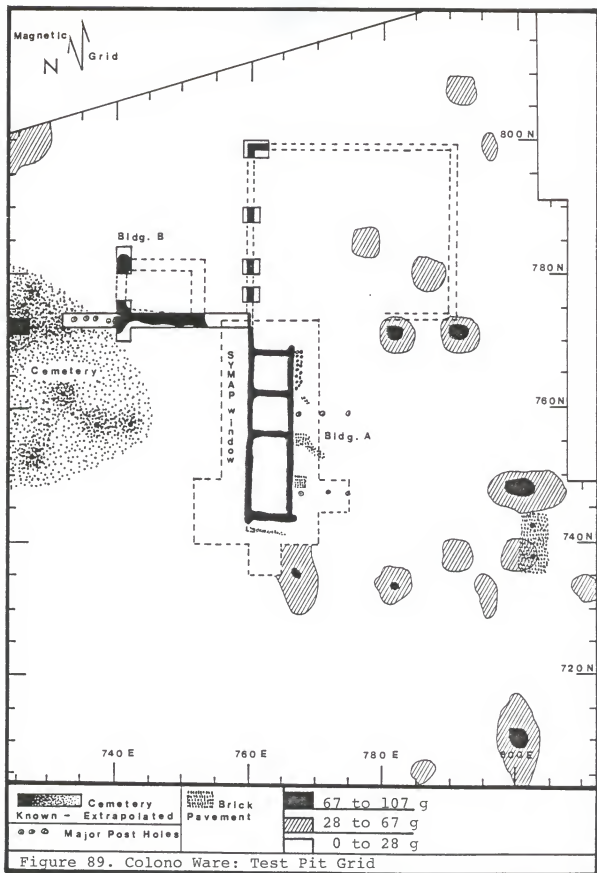


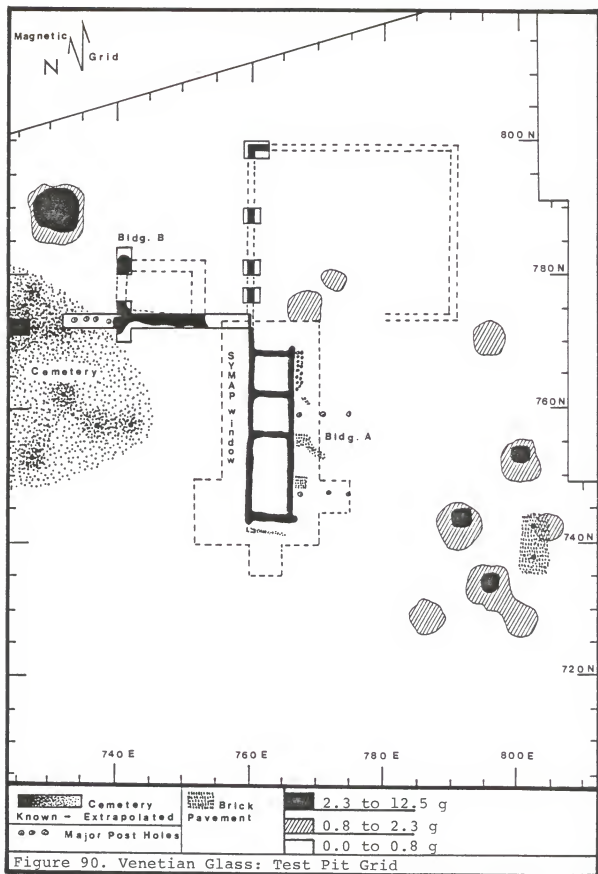


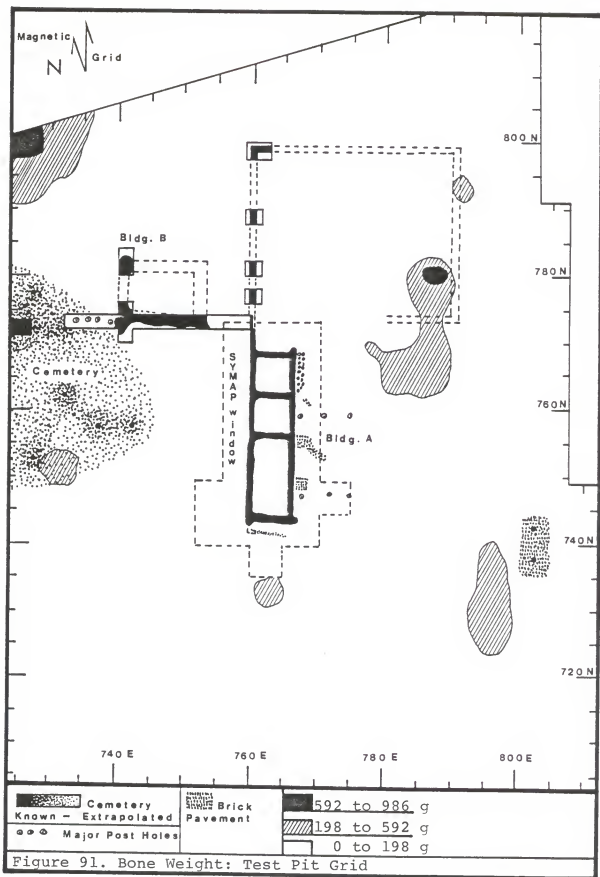


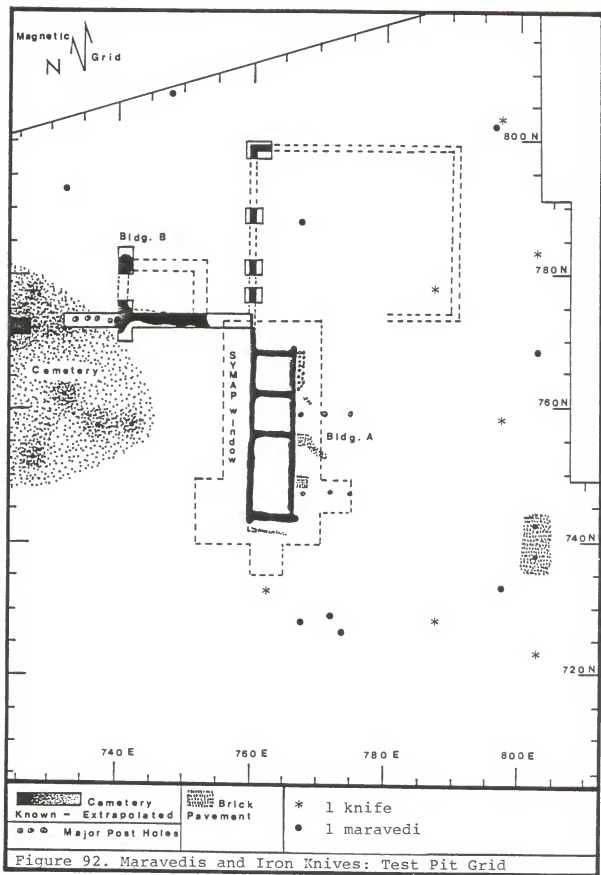












Architectural Materials Distribution

Five density maps were produced measuring the spatial distribution of mortar, plaster, stone, rooftile, and iron nails (Figures 73 to 77). These maps were used to delineate additional masonry structures. The most intense concentration of mortar, plaster, stone, and rooftile occurs immediately northwest of the church at the location of Building B tower. Of the four variables mapped, plaster most closely delineates the size and shape of the structure as postulated from Marrinan's 1981 excavations (1983:52). Plaster is probably associated with the building's interior surface.

Both mortar and stone, although heavily deposited over the tower site, show a more widely scattered dispersal. Stone is more scattered than mortar because of mortar's specialized architectural function versus stone's many generalized functions. (Also, stone does not occur naturally near the site of Puerto Real and is imported from nearby mountains.) Of particular interest is the semi-circular pattern of stone concentrations in the southeast quadrant of the grid test area. These stone concentrations are not associated with any concentrations of mortar. The implications of this situation will be discussed later.

Rooftile appears to be more widely dispersed than the above three items. This probably results from its position on top of the structural debris piles. As such

it would have been more disturbed during salvage operations than other material. Still, definite concentrations occur at the tower as well as an increasingly high concentration just to its west, directly overlaying the linear post hole configuration and the northern fringe of the cemetery. This deposition pattern supports the postulated covered portico-type structure suggested by Marrinan (1983:52) running westward from the tower. This feature would serve to separate the cemetery from the secular activities to the north. Related to this theme of separation of cemetery from daily activities is the fact that the large area south of the cemetery and southwest of the church contains very little architectural materials or non-architectural artifacts. There must be some cultural explanation for this distinct pattern of non-deposition. Most likely it resides in the liturgical rules of sanctified grounds associated with church and cemetery (Kubler 1948:320).

One small area of rooftile concentration occurs just south of the brick pavement located along the 740N line. When this is compared with the iron nail distribution, several minor concentrations of which occur here also, a minor wooden structure roofed in tile is suggested. This structure was probably associated with the brick pavement and the eastern end of the southernmost large earthen mound which was contour-mapped at this location (Figures 5 and 39). The highest concentration of nails occurs west of

the tower overlaying the postulated tile-covered pole-supported portico described earlier.

Non-Architectural Artifact Concentrations

This section provides interpretation of the patterning of non-architectural artifacts in relation to the architectural features delineated through actual excavation and/or test pit interpretation. Mapped artifact categories include historic ceramics, Columbia plain, other maiolica, utilitarian earthenware, green glazed basin sherds, olive jar sherds, honey colored/Seville ware, Colono ware, Venetian glass, bone weight, copper maravedis, and iron knives (Figures 82 to 92).

The first phase of analysis involved making artifact density SYMAPS for each of these categories, represented by high, medium, and low relative densities. Next, a composite overlay was created in which the primary and secondary areas of concentration for each was delineated (Figure 78).

Four distinct zones of artifact concentrations were noted (Figure 79). The spatial relationship of each of these zones is as follows: Zone I with the tower, Zone II with the church's walled courtyard and Room 1, Zone III with the brick pavement/elevated earthen mound/postulated frame tile roofed structure, and Zone IV with the southern (main) entrance into the church.

Analysis of the overall deposition patterns indicates several interesting correlations. First,

artifact deposition associated with the high status masonry structures occurs primarily to their north. This probably relates to the apparently strict rules regarding the relative location of activities within and adjacent to the liturgical complex (Kubler 1948:249). The marked void of deposition south of the cemetery and southeast of the church, directly opposite the nearest areas of intense deposition, supports this contention. A pattern of selective deposition indicates a direct relationship between the cultural rules governing the types of activity permitted in sanctified versus non-sanctified ground during the 16th century at an imperial Spanish town's liturgical complex.

The same pattern is reflected in the general dearth of deposition associated with the most sacred portions of the church structure--the nave and sanctuary/altar area. Here a small concentration radiates southward from the main entrance and a major concentration is found within the walled courtyard which served the clergy's living quarters in Room 1; however, very little is found in between or on either side. It seems likely that sacred areas were not to be profaned by the deposition of trash. Again, this pattern is reflected in the fauna and historic ceramics deposition maps for the church which graphically show the marked change in fauna and historic ceramics deposition from exterior of the structure in Stratum III (imperial Spanish) to interior of the structure in Stratum II (squatter) occupation.

The Zone II distribution is interesting; the deposition pattern mirrors the outline of the walled courtyard/cloister reconstructed from excavation and electrical resistivity data. One minor discrepancy occurs just south of the courtyard's postulated south wall. Unfortunately, the presence of immense excavation spoil piles at this location prevented complete resistivity mapping. However, a portion of what appears to be a very distinct corner reading is registered (Figure 81). Based on the general accuracy of Shapiro's analysis, it is likely that the corner represents the wall's turning point. Regardless, the entire deposition pattern is spatially related to the Room 1 living quarters which is served by the walled courtyard/cloister and represents a homogeneous set of deposition activities related to the day-to-day life of the clergy.

When the entire set of distribution maps is considered, it is apparent that the southeast corner of the courtyard is a discreet area of intense deposition primarily of maolica, green glazed basin, olive jar, and faunal debris. This suggests a prime sampling area for the "backyard" archeology of the church, delineating a favored disposal site serving the clergy's living quarters.

Two test pits produced rather spectacular finds relative to their small size. A test pit located in Zone I produced a 106-cm-long late-16th-century rapier (Stone 1961:525; Figure 72b). The presence of the rapier

substantiates the relative high status associated with the tower and further suggests a possible military function for the tower. The rapier's good condition and undoubtedly high value raise some questions as to how and why it was left behind. Another test pit in Zone III, 5 m southeast of the brick pavement, produced a complete honey colored/Seville ware pitcher (Figure 72f).

To further analyze these four zones of deposition, the artifacts from all test pits contained within each zone were segregated and tabulated separately (Tables 31 to 33). Next the frequencies by artifact classes were plotted on bar graphs (Figure 93). As discussed in the following section, the overall central building complex artifact assemblage (from test pits) mirrors that of the overall church assemblage. The final analytical step involves comparing the patterns of each zone against that of the overall, then postulating cultural reasons for any major discrepancies.

Using an index of maiolica versus utilitarian earthenware as the first relative status indicator, it appears that Zone III represents the lowest status. This is also suggested by Zone III having the largest index of iron to non-ferrous metals of any zone. Zone III is the only zone not associated with a masonry high-status structure, further support for the supposition that it represents the relative lowest status.

Table 30. Artifacts from Central Grid Test Pits, Zone I
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class #	Weight (g)	% Group #	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	31	142.0	93.9	99.2	43.7	14.7
Montelupo polychrome	2	1.1	6.1	.8	2.8	.1
Total	33	143.1	100	100	46.5	14.8
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	3	49.3	8.8	6.7	4.2	5.1
Olive jar	24	385.9	70.6	52.4	33.8	40.1
Green glazed basin	1	276.9	2.9	37.6	1.4	28.8
Orange micaceous ware	2	1.0	5.9	.1	2.8	.1
Unglazed redware	3	14.0	8.8	1.9	4.2	1.4
Unglazed earthenware	1	9.6	2.9	1.3	1.4	1.0
Total	34	736.7	100	100	47.8	76.5
Historic Ceramics: Other						
Colono ware	3	75.8	75.0	91.8	4.2	7.9
Kaolin pipe	1	6.8	25.0	8.2	1.4	.7
Total	4	82.6	100	100	5.6	8.6
Historic Ceramics Total						
	71	962.4			100	100

Historic Metals: Iron

Sword	1	592.4	50.0	99.6	20.0	96.1
Unidentified fragment	1	2.5	50.0	.4	20.0	.4
Total	2	594.9	100	100	40.0	96.5

Historic Metals: Copper

Maravedi	1	3.5	50.0	94.6	20.0	.6
Lace tip	1	.2	50.0	5.4	20.0	.1
Total	2	3.7	100	100	40.0	.7

Historic Metals: Brass

Book clasp	1	17.6	100.0	100.0	20.0	2.8
Total	1	17.6	100	100	20.0	2.8

Historic Metals Total

	5	616.2		100	100	
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Historic Glass: Venetian

Clear	1	12.5	100.0	100.0	100.0	100.0
Total	1	12.5	100	100	100.0	100.0

Historic Glass Total

	1	12.5		100	100	
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Table 31. Artifacts from Central Grid Test Pits, Zone II
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class #	Weight (g)	% Group #	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	90	440.0	84.9	87.0	29.3	14.1
Columbia plain green	6	12.7	5.7	2.5	2.0	.4
Columbia plain gunmetal	5	8.4	4.7	1.7	2.0	.3
Yayal blue on white	1	1.5	.9	.3	.3	.1
Montelupo blue on white	2	40.5	1.9	8.0	.6	1.3
Faenza white	2	2.4	1.9	.5	.6	.1
Total	106	505.5	100	100	34.8	16.3
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	17	97.1	9.3	4.3	5.5	3.1
Olive jar	103	1049.7	56.3	46.4	33.5	33.7
Green glazed basin	11	719.2	6.0	31.8	3.6	23.1
El Morro ware	8	44.3	4.4	1.9	2.6	1.4
Feldspar inlaid redware	1	1.7	.5	.1	.3	.1
Orange micaceous ware	2	6.2	1.1	.3	.6	.2
Unglazed redware	14	150.9	7.7	6.7	4.6	4.8
Unglazed earthenware	24	104.3	13.1	4.6	7.8	3.3
Green glazed ware	3	89.1	1.6	3.9	1.0	2.9
Total	183	2262.5	100	100	59.5	72.6
Historic Ceramics: Cuenca tile						
Cuenca tile	2	109.1	100.0	100.0	.6	3.5
Total	2	109.1	100	100	.6	3.5

Table 31--continued

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Other						
Colono ware	14	231.7	87.5	98.5	4.5	7.4
French faience	1	3.0	6.2	1.3	.3	.1
Oriental blue on white porcelain	1	.6	6.2	.2	.3	.1
Total	16	235.3	100	100	5.1	7.6
Historic Ceramics Total						
	307	3112.4			100	100
Historic Metals: Iron						
Knife	1	7.0	20.0	14.6	10.0	12.6
Chisel	1	30.7	20.0	64.2	10.0	55.4
Unidentified fragment	3	10.1	60.0	21.1	30.0	18.2
Total	5	47.8	100	100	50.0	86.2
Historic Metals: Copper						
Maravedi	1	2.6	20.0	34.2	10.0	4.4
Hawk's bell	4	5.0	80.0	65.8	40.0	9.0
Total	5	7.6	100	100	50.0	13.7
Historic Metals Total						
	10	55.4			100	100

Table 31--continued

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Glass: Venetian						
Clear	5	1.0	50.0	23.2	50.0	23.2
Blue	2	1.3	20.0	30.2	20.0	30.2
Green	3	2.0	30.0	46.6	30.0	46.6
Total	10	4.3	100	100	100.0	100.0
Historic Glass Total						
	10	4.3			100	100

Table 32. Artifacts from Central Grid Test Pits, Zone III
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	89	461.7	88.1	88.7	24.5	12.4
Columbia plain green	3	27.3	3.0	5.2	.8	.7
Ligurian blue on blue	5	5.5	4.9	1.1	1.4	1.1
Santo Domingo blue on white	1	1.2	1.0	.2	.3	.1
Caparra blue	1	4.6	1.0	.9	.3	.1
Montelupo polychrome	2	20.1	2.0	3.9	.5	.5
Total	101	520.4	100	100	27.8	13.9
Historic Ceramics: Cuenca tile						
Cuenca tile	1	93.0	100.0	100.0	.3	2.5
Total	1	93.0	100	100	.3	2.5
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	102	826.2	44.2	30.7	28.1	22.2
Olive jar	79	472.6	34.1	17.6	21.7	12.7
Green glazed basin	10	843.1	4.3	31.4	2.8	22.6
El Morro ware	14	40.2	6.1	1.5	3.9	1.1
Unglazed redware	11	286.3	4.8	10.7	3.0	7.7
Unglazed earthenware	8	125.0	3.5	4.7	2.2	3.4
Green glazed ware	7	92.0	3.0	3.4	1.9	2.5
Total	231	2685.4	100	100	63.6	72.2

Table 32--continued

Type	#	Weight (g)	#	% Class Weight (g)	% #	Group weight (g)
Historic Metals: Brass						
Book clasp	1	28.0	100.0	100.0	11.1	23.5
Total	1	28.0	100	100	11.1	23.5
Historic Metals Total						
	9	118.9			100	100
Historic Glass: Venetian						
Clear	5	4.4	41.7	40.7	33.3	37.3
Green	7	6.4	58.3	59.3	46.7	54.2
Total	12	10.8	100	100	80.0	91.5
Historic Glass: Other						
Unidentified beads	3	1.0	100.0	100.0	20.0	8.5
Total	3	1.0	100	100	20.0	8.5
Historic Glass Total						
	15	11.8			100	100

Table 32--continued

Type	#	Weight (g)	% Class #	Weight (g)	% Group #	Weight (g)
Historic Ceramics: Other						
Colono ware	30	426.0	100.0	100.0	8.3	11.4
Total	30	426.0	100	100	8.3	11.4
Historic Ceramics Total						
	363	3724.8			100	100
Historic Metals: Iron						
Knife	1	14.5	20.0	17.0	11.1	12.2
Scissors	1	7.1	20.0	8.3	11.1	6.0
Hammer	1	57.3	20.0	67.3	11.1	48.2
Unidentified fragment	2	6.2	40.0	7.3	22.2	5.2
Total	5	85.1	100	100	55.5	71.6
Historic Metals: Copper						
Maravedi	1	3.7	33.3	63.8	11.1	3.1
Sheet	1	.7	33.3	12.1	11.1	.6
Unidentified fragment	1	1.4	33.3	24.1	11.1	1.2
Total	3	5.8	100	100	33.3	4.9

	39	432.7	100	100
Historic Metals: Iron				
Knife Plate	1	53.5 50.0	91.3 16.6	79.3
	1	5.1 50.0	8.7 16.6	7.6
Total	2	58.6 100	100 33.2	86.9
Historic Metals: Copper				
Maravedi	3	8.8 100.0	100.0 50.0	13.0
Total	3	8.8 100	100 50.0	13.0
Historic Metals: Brass				
Straight pin	1	.1 100.0	100.0 16.6	.1
Total	1	.1 100	100 16.6	.1
Historic Metals Total				
	6	67.5	100	100
Historic Glass: Venetian				
Clear	1	.7 100.0	100.0 100.0	100.0
Total	1	.7 100	100 100.0	100.0
Historic Glass Total				
	1	.7	100	100

KEY

Ceramics:

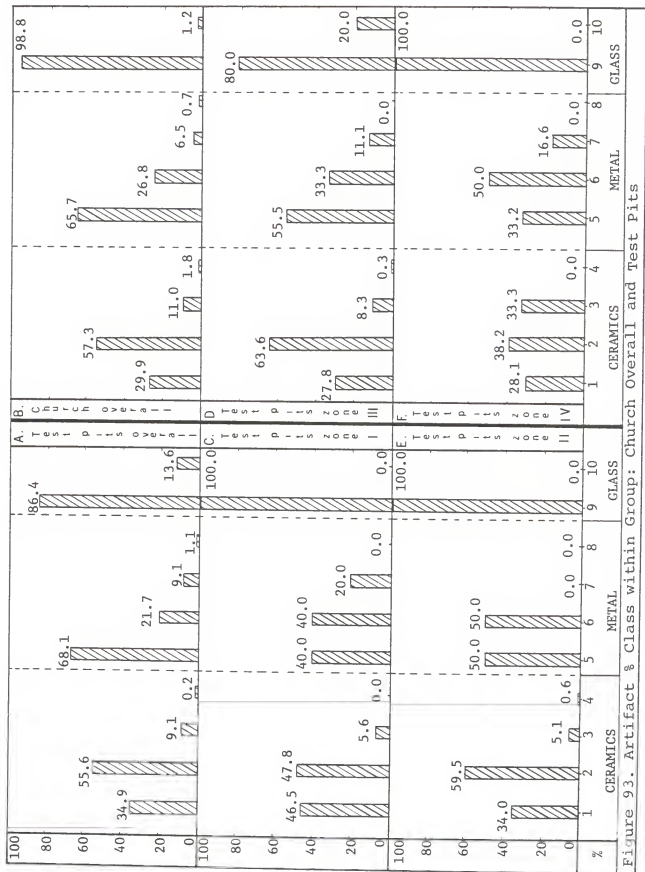
- 1 Maiolica
- 2 Utilitarian earthenware
- 3 Other
- 4 Cuenca tile

Metal:

- 5 Iron
- 6 Copper
- 7 Brass
- 8 Lead

Glass:

- 9 Venetian
- 10 Other



The next lowest status is represented by Zone IV, as indicated by its relatively high percent of Colono ware. Location of this zone, south of the main entrance to the church at a gathering place for the congregation tends to support this ranking. This would be the case because both Zones I and II, which appear to be the highest status areas, are associated with the activities of the actual occupants of the highest-status masonry structures.

In addition to the ceramic-density contour maps, one dot density map was produced showing the combined distribution of the two most numerous metal artifacts: copper maravedis and iron knives. Both the church and the tower seem to receive equal representation of the items; however, two zones of concentration occur. One runs north-south along the eastern boundary of the map and the other is an isolated east-west pattern running between the south end of the brick pavement and southern limits of the church excavation. The latter concentration directly overlays the similarly shaped east-west-oriented earthen mound. This area contains 44% of all the maravedis and 43% of all the iron knives found in this network of test pits across the central building complex.

In attempting to postulate a function for this raised earthen mound, it should be noted that it contains little architectural debris but many artifacts; apparently it is associated with the tile-covered frame structure over the brick pavement. One must also look at its position

adjacent to the liturgical complex. It represents the only major non-architecturally constrained activity area south of the church's main entrance and east of the area of minimal artifact deposition. It appears to be connected to the church by a raised stone walkway, thus making it an "all weather" accessible area; it is itself raised and well-drained. It seems likely that this raised open area and its associated structure represent a zone of high traffic-flow related to the deposition of large amounts of artifacts in direct view of the church-chapel areas (Figure 39). The high frequency of copper maravedis suggest low-scale monetary transactions, while the iron knives indicate a division of materials into smaller segments. These factors suggest that it may have been an open-air market situated in a natural assembly place for people entering and leaving church or in a special area adjacent to the church.

When we assume this area is a marketplace, the artifact distributions of stone and the plain hemispherical Colono ware create an interesting semi-circular pattern of overlapping concentrations of both materials south of the brick pavement area (Figures 39, 75, and 89). This area also produced the third largest concentration of bone fragments within the central sector. Using a modern Haitian open-air marketplace for an analogy, one of the most common scenes is that of women located on the periphery, cooking in hemispherical (aluminum) pots resting on a simple stone hearth.

The positioning of a marketplace in front of a church in Latin America is not a surprising phenomenon. It would only be surprising if one did not exist, for the market is the hub of the town's material life just as the church is the hub of the spiritual life of the town's citizenry. As such, the market shares a position on the central plaza of the imperial Spanish grid town designed as an integral part of this planned community (Foster 1960:47).

One interesting note regarding the separate placement of this proposed marketplace and the cemetery at Puerto Real is that in both medieval Spain and Mexico cemeteries were commonly used as recreation areas and marketplaces by the late 16th century (Foster 1960:47; Kubler 1948:320). This occurs even though, "in canon law the cemetery is a sacred place, withdrawn from profane use. The ground must be consecrated by a bishop or priest . . ." (Kubler 1948:320).

Perhaps the scene at Puerto Real is a result of the same rationale that led to the implementation of the strictly organized grid town on the Spanish colonial New World frontier: the recognition of the opportunity and desire to "start over" with a clean slate with no haphazard growth of towns or use of their interior spaces brought about by centuries of use, re-use, and crowded conditions.

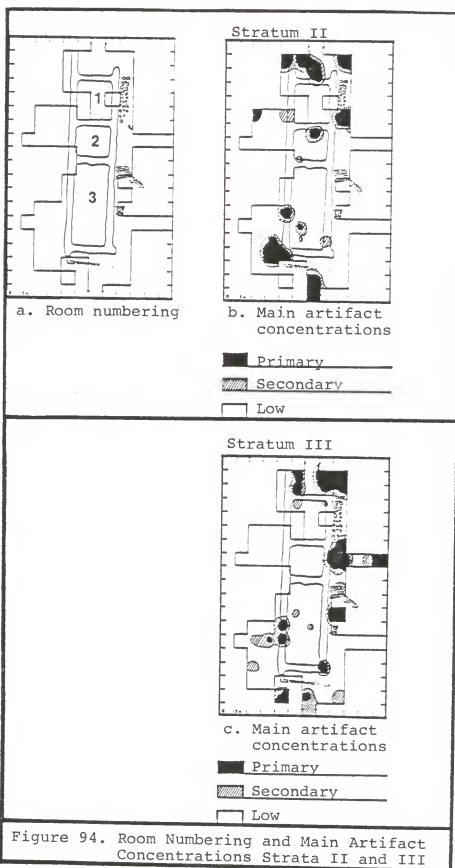
At Puerto Real, in the first half of the 16th century the archeological record shows that there were strict rules regarding the differential use of areas designated "sacred" versus those designated "profane". Such a pattern would be expected at one of Ovando's premier imperially designed towns on Hispaniola. Puerto Real was established through a concentrated and directed effort by a Spain that was determined to turn the tide on the wave of mismanagement initiated by Columbus during the first ten years after discovery (Sauer 1969:100-103). Puerto Real was one of the testing grounds for the developing formal rules of Spanish imperial order. The lessons learned here and elsewhere on Hispaniola would be instrumental in the settlement of Tierra Firme. Formalization of such rules would result in the 1573 city planning ordinances of Philip II and Cardinal Borromeo's instructions on ecclesiastical building, ca. 1580.

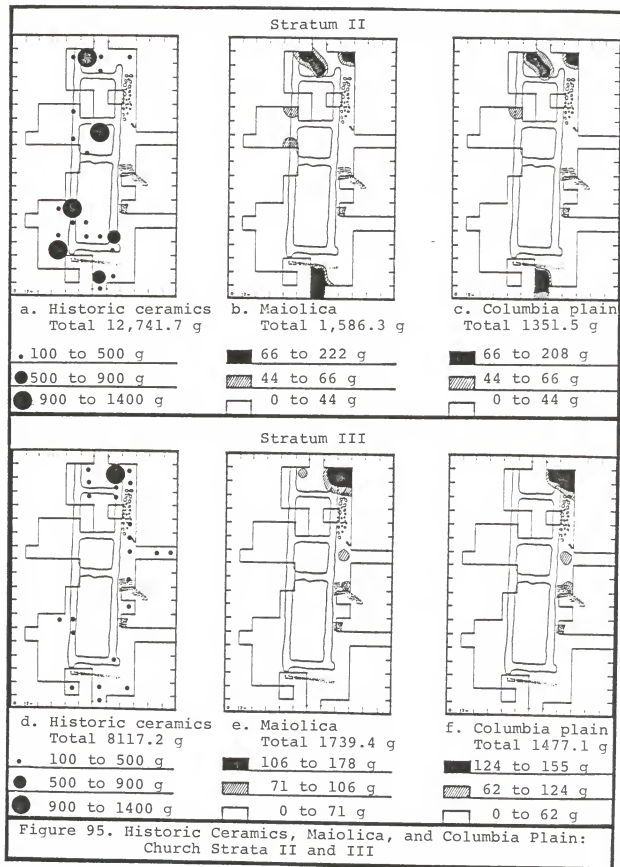
CHAPTER IX
MICRO SPATIAL ANALYSIS: THE CHURCH

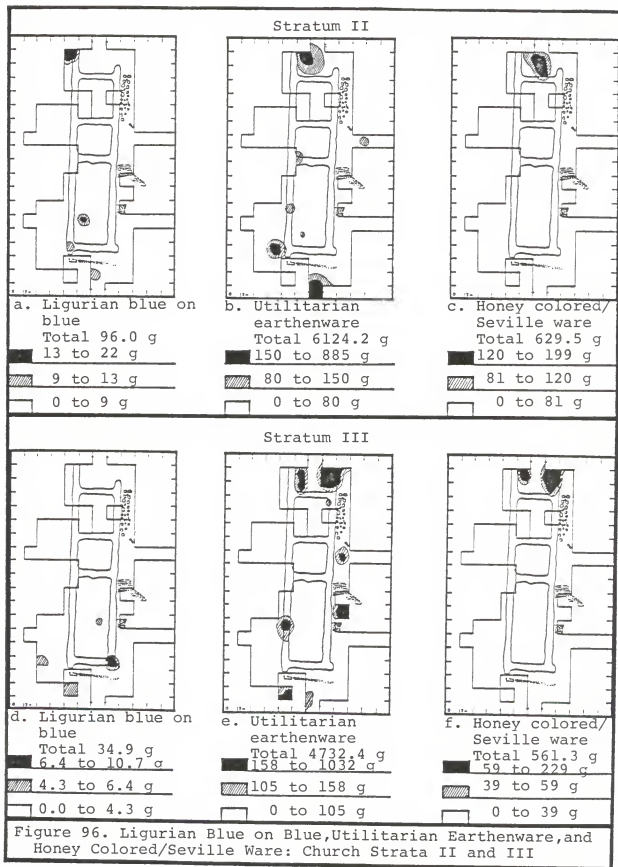
General Excavation

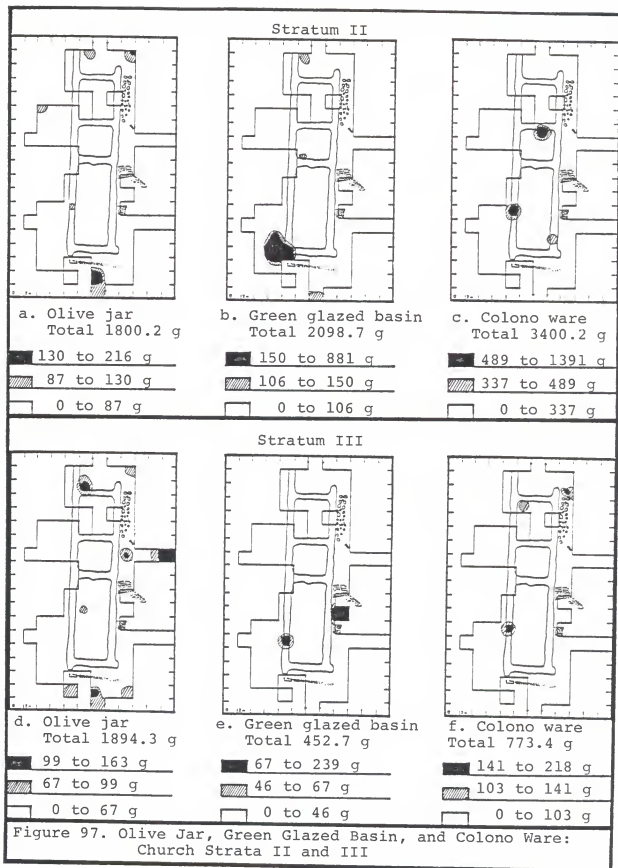
This portion of the analysis of the church's non-architecturally-related artifacts will deal primarily with spatial deposition in Strata II and III. The initial analysis covers distribution maps of the overall church excavations followed by analysis of the interior space excavation units. These interior spaces, or rooms, within the church are numbered 1, 2, and 3 from north to south (Figure 94).

The proportional circle maps, Figures 95a and 95d, show that over one and one-half times the amount of historic ceramics were deposited at the church in Stratum II (12,741.7 g) compared to Stratum III (8,117.2 g). In Stratum II, the squatter occupation, a large amount of deposition occurred within the structure, especially in Rooms 2 and 3. Major areas of deposition in Stratum II appear to be exterior of Room 1, interior of Room 2 and the southern interior and adjacent exterior of Room 3. In Stratum III, the period of imperial Spanish occupation, very little interior deposition took place, especially in Rooms 2 and 3. The major area of deposition for Stratum III appears to be just north of Room 1 with minor depositions occurring exterior of Rooms 2 and 3.

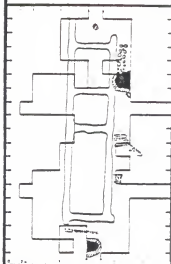








Stratum II

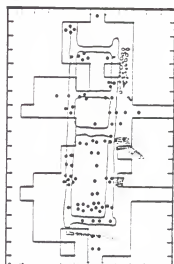


a. Venetian glass
Total 45.7 g

■ 5.9 to 21.0 g

▨ 3.9 to 5.9 g

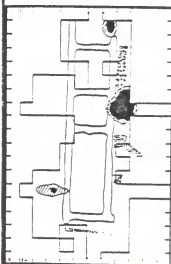
□ 0.0 to 3.9 g



b. Copper maravedis
Total 87 coins

• Single maravedi

Stratum III

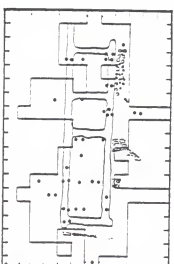


c. Venetian glass
Total 68.4 g

■ 4.4 to 29.3 g

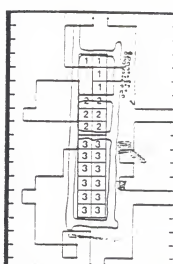
▨ 3.0 to 4.4 g

□ 0.0 to 3.0 g



d. Copper maravedi
Total - 40 coins

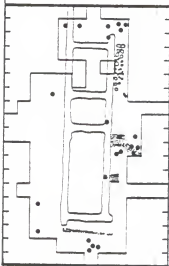
• Single maravedi



e. Interior units
numbered by
room

Figure 98. Venetian Glass and Copper Maravedis: Church
Strata II and III; Interior Units Numbered by Room

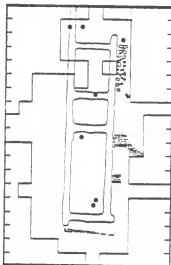
Stratum II



a. Clothing

- Lace tip, buckle, or straight pin

Stratum II



b. Edged weapons

- Knife, sword, or scabbard

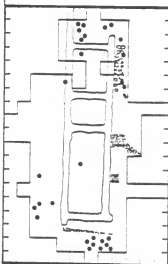
Strata I and II



c. Pipes

- Kaolin pipe fragment

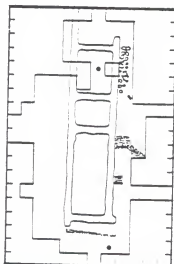
Stratum III



d. Clothing

- Lace tip, buckle, or straight pin

Stratum III



e. Edged weapons

- Knife, sword, or scabbard

Figure 99. Clothing, Edged Weapons, and Kaolin Pipes:
Church, All Units

In addition to more historic ceramics deposited in Stratum II than in Stratum III, the rate of deposition was 3.9 times as rapid during this period. This is estimated by bracketing Stratum III between 1510-1578 (68 years) and Stratum II between 1578-1605 (27 years). During the estimated sixty-eight years of active imperial Spanish occupation, 8,117.2 g of historic ceramics were deposited, at the rate of 119.3 g per year. During the estimated twenty-seven years of squatter occupation 12,741.7 g of historic ceramics were deposited at the rate of 471.9 g per year, or 3.9 times as rapid as Stratum III. This suggests a significant change in trash disposal at the church within the central sector of Puerto Real (a point also made in Chapter VI in reference to the similar pattern of faunal deposition).

To investigate the spatial deposition of artifacts within each of these two strata, artifact density SYMAPS were produced, then reduced and transferred to standard graphics (Figures 95-98). Artifact categories mapped are maiolica, Columbia plain, Ligurian blue on blue, utilitarian earthenware, honey colored/Seville ware, olive jar, green glazed basin, Colono ware, and Venetian glass. High, medium, and low concentrations were delineated relative to each category for each stratum. A composite overlay of primary and secondary concentrations for each stratum was then produced (Figures 94b and c). These maps

provide a similar but more detailed spatial representation of artifact deposition by stratum than do the proportional circle maps discussed earlier.

By and large, the individual deposition maps reiterate the major depositions north and south of the structure which are described above. Of note is the interior of Room 2 in Stratum III being free from any concentration of artifacts except on its eastern side where high-status Venetian glass is found (Figure 98c). However, in Stratum II the interior of this room shows a major concentration of the crude Colono ware (Figure 97c).

In addition to these density contour maps, several maps were produced showing individual distributions of copper maravedis and kaolin pipes (Figures 98 b, 98d, and 99c). Two artifact groupings were similarly plotted: those of clothing (lace tip, buckle, and straight pin) and edged weapons (knife, sword, and scabbard hardware) (Figure 99a, b, d, and e). The Stratum II copper maravedi map shows an intense deposition in Room 3 as well as overall deposition associated with Rooms 2 and 3. In Stratum III less than half as many maravedi were deposited, with Room 3 being the major site and Rooms 1 and 2 being sites of increasingly less deposition.

No kaolin pipes were deposited in Stratum III. In Stratum II the kaolin pipes are centered around Rooms 2 and 3.

The clothing-related artifacts tend to be dispersed outside of the structure in Stratum II. In Stratum III there appear three main concentrations: the north end of Room 1 and the south and southeast exteriors of Room 3. Room 2 contained none of these artifacts. The edged weapons group is over three times more numerous in Stratum II than in Stratum III. All rooms in Stratum II possess these artifacts while Stratum III has only one knife in Room 1 and one sword outside of Room 3.

Interior Rooms

This section will focus on the excavation units falling within each interior space in the church, examining artifact distributions by stratum (Figure 98e). Tables 34 to 39 have been prepared to help interpret specific activities occurring within each of these rooms. Although total numbers of artifacts are low, their discrete spatial provenience gives weight to their interpretive value. Stratum III, associated with the Spanish occupation, will be discussed first (Tables 34 to 36).

Room 1 contains eight different artifact types, all associated with everyday Spanish colonial living activities such as food preparation/consumption and clothing. Columbia plain and honey colored/Seville ware are the primary European ceramics, both traditional 16th-century Spanish tablewares. The presence of olive jar

Table 34. Artifacts from Room 1, Stratum III, Church North End
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	9	67.0	100.0	100.0	42.8	24.4
Total	9	67.0	100	100	42.8	24.4
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	4	27.6	66.6	44.2	19.0	10.1
Olive jar	1	15.7	16.7	25.1	4.8	5.7
Green glazed ware	1	19.2	16.7	30.7	4.8	7.0
Total	6	62.5	100	100	28.6	22.8
Historic Ceramics: Other						
Colono ware	6	144.6	100.0	100.0	28.6	52.8
Total	6	144.6	100	100	28.6	52.8
Historic Ceramics Total						
	21	274.1			100	100
Historic Metals: Iron						
Knife	1	19.6	100.0	100.0	33.3	83.4

Total	1	19.6	100	100	33.3	83.4
Historic Metals: Copper						
Maravedi	1	3.7	50.0	94.9	33.3	15.7
Lace tip	1	.2	50.0	5.1	33.3	.9
Total	2	3.9	100	100	66.6	16.6
Historic Metals Total						
	3	23.5		100		100

Table 35. Artifacts from Room 2, Stratum III, Church North Center
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	1	12.6	100.0	100.0	20.0	28.8
Total	1	12.6	100	100	20.0	28.8
Historic Ceramics: Utilitarian earthenware						
Olive jar	1	8.5	33.3	28.8	20.0	19.4
Feldspar inlaid redware	1	17.1	33.3	58.0	20.0	39.0
Thin unglazed redware	1	3.9	33.3	13.2	20.0	8.9
Total	3	29.5	100	100	60.0	67.3
Historic Ceramics: Other						
Oriental blue on white porcelain	1	1.7	100.0	100.0	20.0	3.9
Total	1	1.7	100	100	20.0	3.9
Historic Ceramics Total						
	5	43.8			100	100
Historic Metals: Iron						
Unidentified fragment	9	30.2	90.0	53.8	81.8	50.8
Latch	1	25.9	10.0	46.2	9.1	43.6

Total	10	56.1	100	100	90.9	94.4
Historic Metals: Copper						
Maravedi	1	3.3	100.0	100.0	9.1	5.6
Total	1	3.3	100	100	9.1	5.6
Historic Metals Total						
	11	59.4		100	100	

Table 36. Artifacts from Room 3, Stratum III, Church South End

* All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain Ligurian blue on blue	3	6.4	60.0	49.6	15.0	3.7
	2	6.5	40.0	50.4	10.0	3.7
Total	5	12.9	100.0	100.0	25.0	7.4
Historic Ceramics: Utilitarian earthenware						
Olive jar El Morro ware Green glazed ware Thin unglazed redware	12	135.4	80.0	84.2	60.0	78.0
	1	17.4	6.7	10.8	5.0	10.0
	1	7.0	6.7	4.4	5.0	4.0
	1	1.0	6.7	.6	5.0	.6
Total	15	160.8	100	100	75.0	92.6
Historic Ceramics Total						
	20	173.7			100	100
Historic Metals: Iron						
Band Unidentified fragment	1	23.4	14.3	34.7	6.3	22.5
	6	44.0	85.7	65.3	37.5	42.3
Total	7	67.4	100.0	100.0	43.7	64.8

Historic Metals: Copper

Maravedi	8	36.5	100.0	100.0	50.0	35.1
Total	8	36.5	100	100	50.0	35.1
Historic Metals: Brass						
Straight pin	1	.1	100.0	100.0	6.2	.1
Total	1	.1	100	100	6.2	.1
Historic Metals Total						
	16	104.0		100	100	

Table 37. Artifacts from Room 1, Stratum II, Church North End
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Utilitarian earthenware						
Olive jar	7	52.9	100.0	100.0	87.5	93.8
Total	7	52.9	100	100	87.5	93.8
Historic Ceramics: Other						
Kaolin pipe	1	3.5	100.0	100.0	12.5	6.2
Total	1	3.5	100	100	12.5	6.2
Historic Ceramics Total						
	8	56.4			100	100
Historic Metals: Copper						
Maravedi	4	15.0	100.0	100.0	100.0	100.0
Total	4	15.0	100	100	100.0	100.0
Historic Metals Total						
	4	15.0			100	100

Table 38. Artifacts from Room 2, Stratum II, Church North Center
 * All final percents rounded to nearest whole

Type	#	Weight (g)	#	% Class Weight (g)	#	% Group Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	1	3.6	100.0	100.0	2.0	.2
Total	1	3.6	100	100	2.0	.2
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	1	4.3	12.5	2.5	2.0	.2
Olive jar	1	19.6	12.5	11.3	2.0	.9
Green glazed basin	1	104.5	12.5	60.5	2.0	4.9
Feldspar inlaid redware	3	9.2	37.5	5.3	5.9	.4
Green glazed ware	2	35.1	25.0	20.4	3.9	1.7
Total	8	172.7	100	100	15.8	8.1
Historic Ceramics: Cuenca tile						
Cuenca tile	3	463.5	100.0	100.0	5.8	21.9
Total	3	463.5	100	100	5.8	21.9
Historic Ceramics: Other						
Colono ware	32	1428.6	82.1	96.6	62.7	67.4
Oriental blue on white porcelain	5	11.6	12.8	.8	9.8	.5
Kaolin pipe	2	39.3	5.1	2.6	3.9	1.9
Total	39	1479.5	100	100	76.4	69.8

Historic Ceramics Total

	51	2119.3	100	100
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Historic Metals: Iron

Knife	1	48.8	3.8	4.3	3.6	3.6
Horseshoe	3	594.1	11.6	51.9	10.6	43.8
Scabbard tip	1	38.6	3.8	3.4	3.6	2.9
Unidentified fragment	20	416.0	77.0	36.4	71.4	30.7
Cotter key hinge	1	46.2	3.8	4.0	3.6	3.4
Total	26	1143.7	100	100	92.8	84.4

Historic Metals: Copper

Maravedi	1	14.1	100.0	100.0	3.6	1.0
Total	1	14.1	100	100	3.6	1.0

Historic Metals: Brass

Cup	1	197.9	100.0	100.0	3.6	14.6
Total	1	197.9	100	100	3.6	14.6

Historic Metals Total

	28	1355.7	100	100
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Table 39. Artifacts from Room 3, Stratum II, Church South End
 * All final percents rounded to nearest whole

Type	#	Weight (g)	% Class		% Group	
			#	Weight (g)	#	Weight (g)
Historic Ceramics: Maiolica						
Columbia plain	7	35.0	38.9	61.0	11.1	3.7
Columbia plain green	1	3.8	5.6	6.6	1.6	.4
Ligurian blue on blue	10	18.6	55.5	32.4	15.9	1.9
Total	18	57.4	100	100	28.6	6.0
Historic Ceramics: Utilitarian earthenware						
Honey colored/Seville ware	2	8.7	5.4	1.5	3.2	.9
Olive jar	4	18.1	10.8	3.0	6.3	1.9
El Morro ware	1	9.5	2.7	1.6	1.6	1.0
Feldspar inlaid redware	3	11.0	8.1	1.8	4.7	1.1
Unglazed earthenware	1	37.5	2.7	6.3	1.6	3.9
Yellow glazed redware	26	510.6	70.3	85.8	41.3	53.5
Total	37	595.4	100	100	58.7	62.3
Historic Ceramics: Other						
Colono ware	7	298.4	87.5	98.7	11.1	31.3
Kaolin pipe	1	4.0	12.5	1.3	1.6	.4
Total	8	302.4	100	100	12.7	31.7
Historic Ceramics Total						
	63	955.2			100	100

Historic Metals: Iron

Knife	1	39.4	.8	3.6	.7	3.4
Band	3	96.4	2.5	8.8	2.1	8.2
Sword	2	80.6	1.7	7.3	1.4	6.9
Unidentified fragment	111	403.6	91.8	36.8	78.2	34.4
Horse bit	1	205.6	.8	18.8	.7	17.6
O-ring	1	60.5	.8	5.5	.7	5.2
Chain	1	8.1	.8	.7	.7	.7
Hoe blade	1	202.4	.8	18.5	.7	17.3
Total	121	1096.6	100	100	85.2	93.7

Historic Metals: Copper

Maravedi	21	74.3	100.0	100.0	14.8	6.3
Total	21	74.3	100	100	14.8	6.3

Historic Metals Total

	142	1170.9		100		100
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Historic Glass: Venetian

Clear	1	.6	50.0	54.5	50.0	54.5
Blue	1	.5	50.0	45.5	50.0	45.5
Total	2	1.1	100	100	100.0	100.0

Historic Glass Total

	2	1.1		100		100
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indicates water or condiment storage. Presence of Colono ware indicates the possibility of lower status or utilitarian activities. The iron table knife indicates food preparation and/or consumption, and the copper lace tip suggests the presence of European clothing.

In Room 2 perhaps the only difference is the absence of the lower status Colono ware and the presence of the high status oriental blue on white porcelain. The largest category of artifacts was that of unidentified iron fragments.

Room 3 has twice the volume of Rooms 1 or 2. In it, the largest number of ceramic sherds are from the ubiquitous Spanish storage vessel, the olive jar. Metal is represented predominantly by the presence of eight copper maravedis, indicating perhaps some form of monetary exchange associated with the room. Presence of the brass straight pin suggests European clothing.

During the imperial Spanish occupation of the church, the rooms are most notable for the small amount of material deposition contained therein. However, several inferences can be made from the recovered materials.

Room 1 appears associated with day-to-day activities of food preparation/consumption, clothing, and the lower status activities. Room 2 appears to be similar; however, the status of activity here seems to be elevated due to the lack of the Colono ware and the presence of the finest ceramics, oriental blue on white porcelain. Room 3

appears to be associated with formalized activities requiring monetary exchange (taxes, tithes, or purchases).

Conspicuous is the absence of any archeologically discerned features for Stratum III within these rooms. An opposite situation exists for Stratum II, in which numerous features are associated with cultural activities.

The interior spaces of the church during the squatter occupation, represented by Stratum II, will be discussed next. As stated earlier, Room 1 in Stratum II revealed relatively very little occupational debris in either the stratum as a whole or in the room. This appears to be the result of the room's having been filled with rooftile debris, tossed there prior to squatter occupation. This debris may have been deposited by the squatters as they cleared Rooms 2 and 3 of collapsed roof material to make living space.

Complete tiles which survived the building's original demolition may well have been taken to Bayaha to use in new construction. Departing Spaniards, not planning on re-use of the church, would have no incentive to carefully clear Rooms 2 and 3 and neatly deposit tile fragments in Room 1. Had any whole tiles been left it would seem likely their remains would have been found within the squatter occupation lean-to areas, but only fragments were found there. Thus, it is assumed that the departing Spaniards took all useable tiles with them and that the squatters cleared Rooms 2 and 3 of rooftile debris

and deposited it in Room 1. Roofing for the lean-to pole structures in Rooms 2 and 3 is assumed to have been either thatch or hides.

Both Rooms 2 and 3 were subjected to occupation following the abandonment of Puerto Real by loyal Spaniards in 1578 (Figure 100). Tables 37 to 39 list the artifacts within the standing ruins of the church associated with this occupation.

The most significant feature in Room 2 was a shallow, black charcoal and humic filled hearth/refuse area abutting the northern wall. This feature was 45 cm east-west by 30 to 35 cm north-south and 15 to 20 cm deep. It contained a large and diverse amount of cultural material: ceramic, iron, and faunal. The faunal material from this feature was chosen to be identified since it represented such a tightly closed provenience. Table 22 lists these faunal remains, and Table 40 lists the ceramic and metal remains.

It is interesting to note that the basic types of ceramics utilized in Room 2, Stratum II, did not change greatly from those during the imperial Spanish occupation of Room 1. However, although the types did not change greatly, their frequencies did. Of primary note is the large proportion of crude Colono ware, composing 62.7% of the total ceramics. Another significant increase is that of oriental blue on white porcelain composing 9.8% of the total. Another difference is the inclusion of two

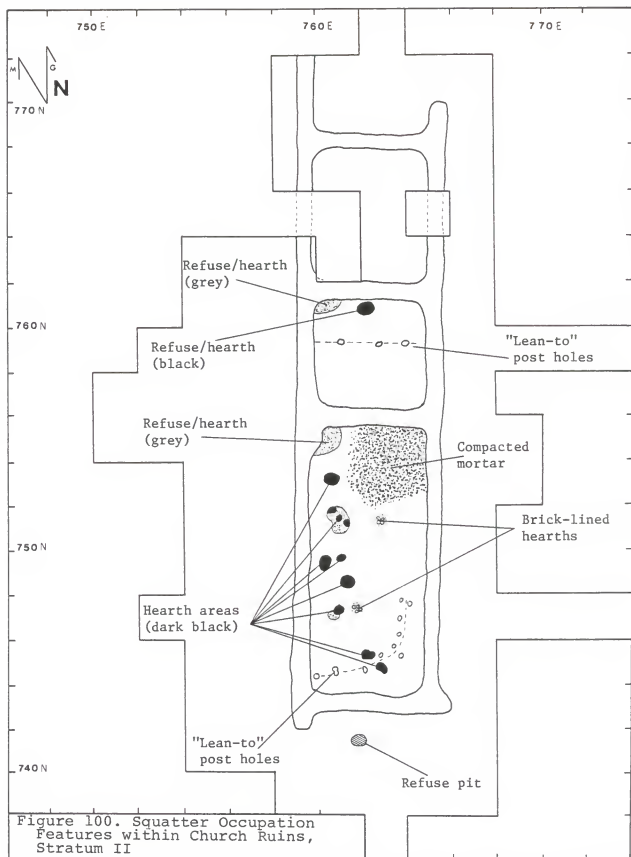


Figure 100. Squatter Occupation
Features within Church Ruins,
Stratum II

Table 40. Artifacts from Hearth/Refuse Pit, Room 2,
Stratum II

Type	Number	Weight (g)
Columbia plain	1	3.6
Cuenca tile	3	463.5
Honey colored/Seville ware	1	4.3
Feldspar inlaid redware	3	9.2
Colono ware	31	1391.0
Oriental blue on white porcelain	5	11.6
Iron scabbard tip	1	38.6
Unidentified iron fragment	16	54.4
Iron cotter key hinge	1	46.2
Iron nail fragments	1	50.2

kaolin pipe fragments, suggesting European but not Iberian contact, i.e. rescate.

An interesting assemblage of metal artifacts was presented. Included was an iron table knife, an iron cotter-key hinge, horseshoe fragments, and an iron scabbard tip. Only one copper maravedi was recovered here. Of note are a small carved bone handle and a finely turned brass cup (Figures 52d and 61i). In review, it seems reasonable to suggest that Room 2 during the squatter occupation functioned as a living, cooking area. The artifact assemblage indicates continuing but declining informal Spanish influence as well as increased non-Spanish European influence. However, the bulk of the ceramic assemblage, sherds from plain Colono ware hemispherical cooking bowls, indicates special New World adaptations. Horseshoes reflect the significance of cattle and equine herds while the scabbard tip suggests a degree of "military" or violence-oriented activity. The fine brass cup and oriental blue on white porcelain indicate that luxury items still were available to the squatter residents of Puerto Real and suggest that the cattle herds remained a viable economic resource.

In addition to the hearth/refuse pit and general strata in Room 2, there were several post holes containing historic construction debris. The linear positioning of three of these post holes suggests a pole and lathing wall for the squatter living quarters on the north side

(Figure 100). It is assumed that the southern masonry wall between Rooms 1 and 2 was demolished prior to squatter occupation allowing easy access to Room 1 for rooftile deposition while clearing out Rooms 2 and 3.

Large amounts of non-faunal cultural debris are recorded in Room 3 in Stratum II. In comparison to Room 2 the amount of Colono ware is much lower, 11.1%, while maiolica is much greater, 28.6%. Of note among the utilitarian earthenwares is the abundance of the apparently non-Spanish yellow glazed redware, described earlier, which comprises 41.3% of all ceramics. Another non-Spanish, European artifact included is a kaolin pipe fragment. Horse tackle is represented by an iron horse bit and O-ring. Two sword fragments, one the tip of a cutlass-shaped blade and one the tip of a straight-bladed semi-broad sword, were also found, as well as an iron chain link and an iron hoe blade. Twenty-one copper maravedis were also found and it appears that again, as in Stratum III, this largest of rooms was the focus of some form of monetary transactions. This is unlike the Stratum III pattern; there was much more occupational living debris in Room 3 during this later period. The presence of Venetian glass in Room 3 also illustrates that luxury items were still available at Puerto Real.

Another notable aspect of Room 3, in Stratum II, is the presence of ten distinct, dark black charcoal and ash-filled, open hearths (Figure 100). Unlike the

hearth/refuse pit described for Room 2, these shallow fire pit areas contained fewer material remains. Four of these pits were on top of localized areas of hard-packed reddish orange clay. Two had a crudely-laid brick lining. The redness results from repeated burning which has removed organic materials from the underlaying midden and clays. Intense oxidation (burning) of these soils results in a burnt orange color. The majority of these hearth areas occupy the western side of Room 3 and one overlays (thus post-dates) the linear north-south fence/palisade in Stratum IV (Figure 17c). Other than the above-mentioned bricks, some food bone, and a single maravedi were the only artifacts from these hearths.

The majority of Stratum II post holes came from the southern half of Room 3. Figure 100 illustrates a slightly curving east-west pattern. Three of the post holes contained historic material: plaster and olive jar.

Several other post holes fall along this same east-west line. Two of these appear to be replacement or support posts dug side by side (identical to one containing historic material). This pattern suggests a southern pole wall erected by the squatter occupants of the church. The entrance appears to be on the east side, opposite the hearths. No daubing material was present, suggesting that horizontal planking or more likely woven lathing strips made up the wall's mass. The lateral walls of this lean-to structure(s) were composed of the remnants of the church's

masonry walls. Their height is difficult to estimate accurately but was probably at least near head height (around 2 m).

Associated with Stratum II in Room 3 is a refuse pit. It is located between the southern foundation of Room 3 and the dry-laid stone walkway. This small pit, 30 cm deep and 35 to 40 cm in diameter, produced the artifacts listed in Table 41.

Table 41. Artifacts from Refuse Pit between Room 3 and Stone Walkway, Stratum II

Type	Number	Weight (g)
Columbia plain	2	19.8
Montelupo polychrome	1	28.7
Olive jar	1	45.1
El Morro ware	4	66.8
Unidentified iron	2	5.2
Iron horse bit	1	122.8
Iron corner bracket	1	6.8
Ornate brass buckle	1	45.1
Clear Venetian glass	1	.1

All these materials appear to be 16th-century Spanish.

The brass buckle appears to be part of an ornate book buckle or clasp, obviously of fine workmanship and high status (Figure 60). Exact nature of the pit is unknown; it may represent debris removed from Room 3 during squatter lean-to site preparation.

CHAPTER X

TEMPORAL ANALYSIS: THE CHURCH

In an attempt to interpret the material excavated at the church, an initial "macro" analysis was undertaken followed by a two-phase "micro" analysis. This is done (as in spatial analysis) to first define the matrix of the phenomenon, then to describe the cultural implications of artifactual patterning.

Macro Analysis

First, it is necessary to establish an overall comparative base of artifact frequencies for artifact classes for all of the church's excavation material; i.e., to determine the percentage which classes of maiolica, utilitarian earthenware, and cuenca tile comprised of the entire group of historic ceramics. Figure 101b is the resulting bar graph for ceramics, metal, and artifact classes from all strata.

As stated earlier, the overall church pattern mirrors the overall pattern for the central sector of the town which was sampled by 392 test pits (Figure 101a). This pattern suggests that the artifacts excavated from the church are representative of the central section of the grid town of Puerto Real, the church within its liturgical context.

KEY

Ceramics:

- 1 Maiolica
- 2 Utilitarian earthenware
- 3 Other
- 4 Cuenca tile

Metal:

- 5 Iron
- 6 Copper
- 7 Brass
- 8 Lead

Glass:

- 9 Venetian
- 10 Other

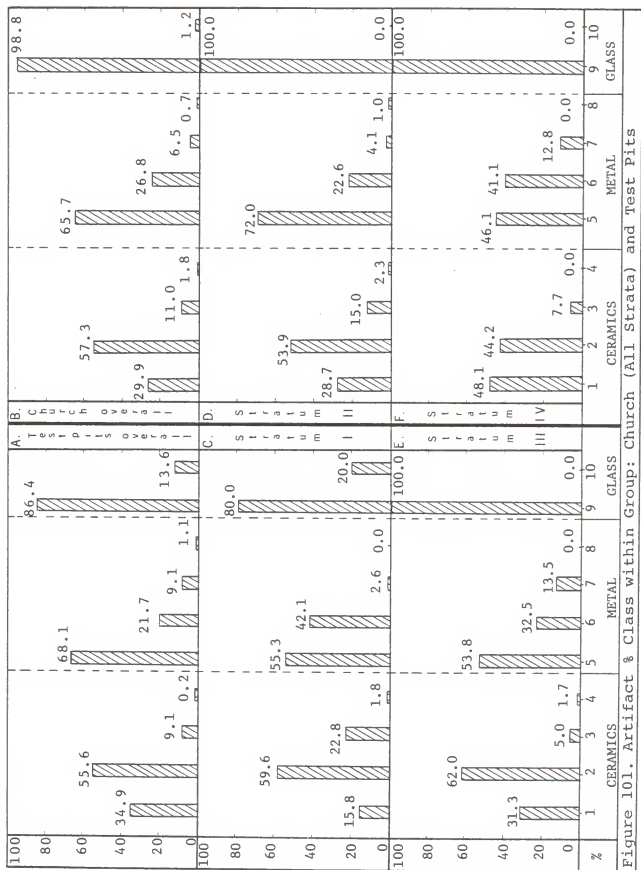


Figure 101. Artifact & Class within Group: Church (All Strata) and Test Pits

Next, the same type graphs were plotted for each stratum, I through IV (Figure 101c-e). In general, the patterns generated followed the overall patterns previously established. However, several discrepancies occurred. First is the absence of the class cuenca tile from Stratum IV. Second is the steadily declining percentage of maiolica from Stratum IV at 48.1%, to Stratum III at 31.3%, to Stratum II at 28.7%, to Stratum I at 15.8%. Also Stratum IV is the only stratum in which the frequency of maiolica is greater than that of utilitarian earthenware. Third is the increase in the class "other" from 7.7% in Stratum IV, to 5% in Stratum III, to 15% in Stratum II, to 22.8% in Stratum I.

The first discrepancy, the absence of cuenca tile from Stratum IV, can be explained by its restricted architectural function, i.e., as decorative paneling in masonry high-status structures. That it did not appear in Stratum IV indicates that little high-status masonry construction was done prior to the church.

The second notable difference is the changing relative frequency of maiolica. The decline through time of this Spanish ceramic type (from Strata IV to I) mirrors the declining imperial Spanish influence at the town of Puerto Real.

In Stratum IV Colono ware is the only type within the "other" class. Stratum III has three types and

and Stratum II has four ceramic types within this class of predominantly non-Spanish ceramics. This pattern also reflects the dissolution of imperial Spanish influence at Puerto Real.

Micro Analysis

To further examine the temporal distribution of artifacts at the church, two phases of a "micro" approach are utilized. First, each class of artifact is graphed over time and the frequency of each class within Strata IV to I is plotted (Figure 102).

As a class, maiolica appears to follow the expected trends for a dissipative imperial Spanish system as does the class of utilitarian earthenware. However the class "other" shows a marked increase from Stratum III, 20.5%, to Stratum II, 55%. This suggests that a non-Spanish, formally controlled system was developing during this time in Puerto Real at least in respect to this class of ceramics. Cuenca tile's frequency is deceptive; a decorative Spanish architectural element, its useage and some deposition occurred in Stratum III, 40.6%, while a slightly increased deposition, 50% occurred in Stratum II. However, this Stratum II deposition results primarily from deposition due to collapse of the church.

Examination of the chart for iron artifacts indicates a large increase from Stratum III, 18.4%, to Stratum II, 73%. This possibly results from the combination

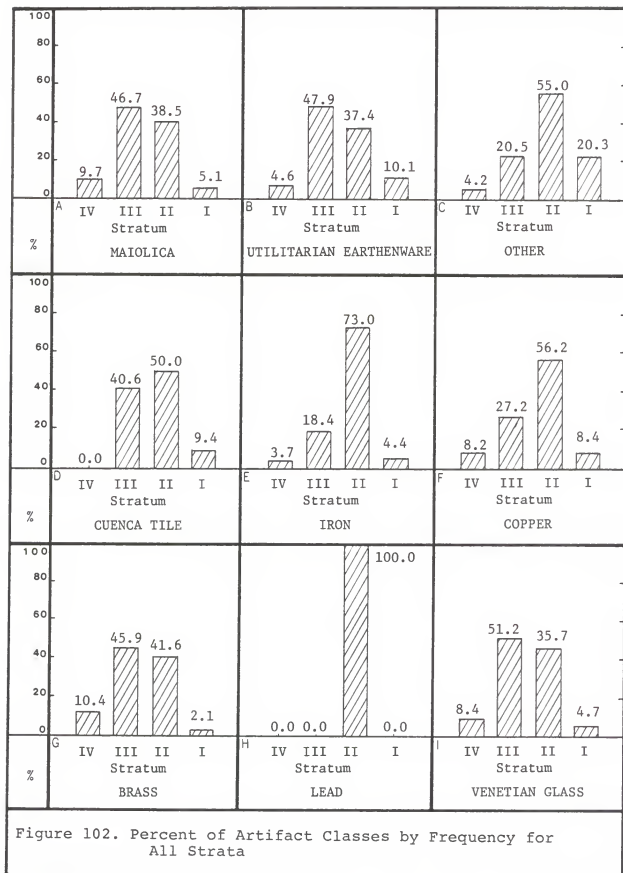


Figure 102. Percent of Artifact Classes by Frequency for All Strata

of two factors operating during the Stratum II period:

1) deposition of iron materials related to the church and its collapse; and, 2) deposition of iron materials as a result of the squatter occupation. In addition, the class of copper artifacts shows a marked increase from Stratum III, 27.2%, to Stratum II, 56.2%, suggesting the possible growth of a non-Spanish system developing at this period in Puerto Real's history, at least in respect to the class of copper artifacts. The copper maravedis are the most numerous copper artifact (Table 4). That they should increase markedly from Stratum III to II is perhaps reflective of the ongoing rescate trade in hides by the remanant squatter population of Puerto Real.

Brass artifacts appear to follow the same pattern as do maiolica, utilitarian earthenware, and Venetian glass. Lead appears in only minute amounts (in Stratum II), too small for meaningful analysis.

The next stage micro analysis is designed to examine further these apparent trends in artifact distribution. Bar graphs were prepared of all artifact types with ≥ twenty items (Figures 103 and 104).

The maiolica types produced the following results:

- 1) Columbia plain produced the expected pattern; and,
- 2) Ligurian blue on blue increased substantially from 26.2% in Stratum III to 57.4% in Stratum II.

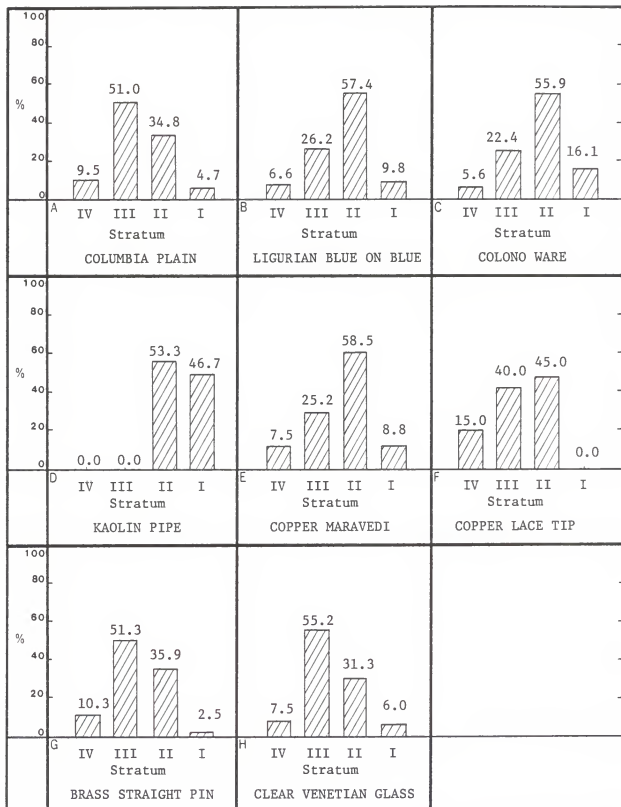
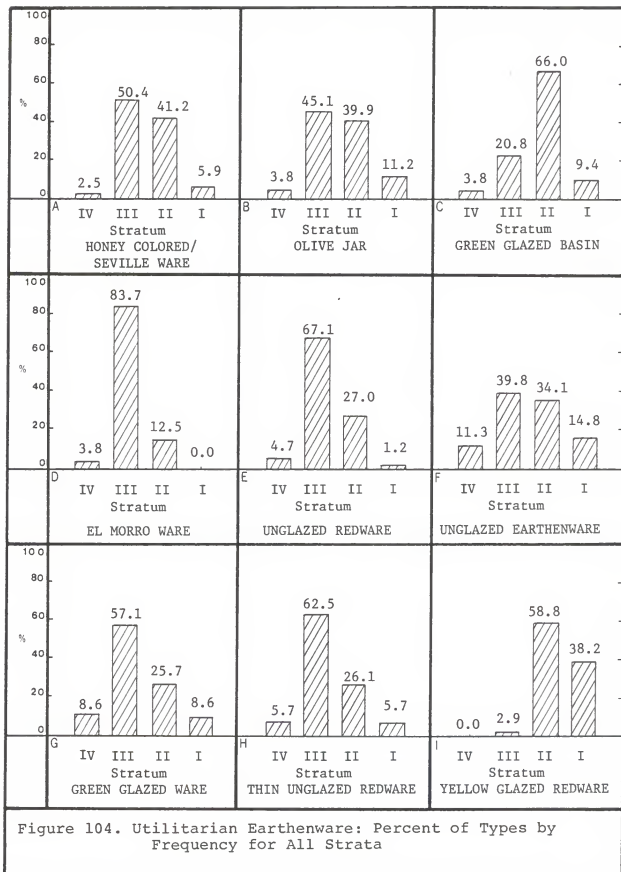


Figure 103. Various Ceramic, Metal, and Glass Types: Percent of Types by Frequency for All Strata



Within the utilitarian earthenware the graphs produced were as follows:

- 1) Honey colored/Seville ware produced the expected pattern;
- 2) Olive jar produced the expected pattern;
- 3) Green glazed basin showed a dramatic increase from 20.8% in Stratum III to 66% in Stratum II;
- 4) El Morro ware produced the expected pattern;
- 5) Unglazed redware produced the expected pattern;
- 6) Unglazed earthenware produced the expected pattern;
- 7) Thin unglazed redware produced the expected pattern;
- 8) Yellow glazed redware produced a marked increase from Stratum III at 2.9% to 58.8% in Stratum II;
- 9) Colono ware (the third most frequent ceramic type during excavation) produced a marked increase from 22.4% in Stratum III to 55.9% in Stratum II; and,
- 10) Kaolin pipe fragments produced the most dramatically non-imperial Spanish pattern from 0% in Strata IV and III to 53.3% in Stratum II.

Table 3 shows that two additional non-Spanish artifact types produced aberrant patterns while one produced the expected pattern:

- 1) Rhinish stoneware produced the expected pattern;
- 2) Oriental blue on white porcelain produced a rise from 33.3% in Stratum III to 66.6% in Stratum II; and,
- 3) Red clay pipe occurred only in Stratum I.

However, samples of these last three types are small and may not be adequate for analysis.

Only five Rheinisch stoneware sherds were present along with twelve oriental blue on white sherds and one red clay pipe fragment. These artifacts are important because they indicate the wide trade networks in the New World during the 16th century. Even with the very small sample of oriental blue on white porcelain, it is notable that its post-1578 increase at Puerto Real mirrors the increased availability of this ceramic type in the Caribbean due to the implementation of the Manila Galleon trade in 1571.

When the metal artifacts are examined in this manner, only three types have an occurrence $\geq$ twenty: copper maravedis, copper lace tips, and brass straight pins.

- 1) Copper maravedi showed a marked increase from 25.2% in Stratum III to 58.5% in Stratum II;
- 2) Copper lace tips produced nearly equal amounts in Stratum III at 40% and Stratum II at 45%. Its 15% frequency in Stratum IV and its absence in Stratum I show that this type follows that of the expected pattern; and,
- 3) Brass straight pins show the expected pattern.

A possible explanation of the increased percentage of Ligurian blue on blue from Stratum III and Stratum II is this type dates mainly to the second half of the 16th century and therefore its percentage should increase during this period. It also might relate to the growing Italian, as opposed to strictly Spanish, influence in the New World at this time (Lister and Lister 1982:72).

Another non-expected pattern was produced for the ceramic type green glazed basin. This increase is probably related to its utilitarian function as either a large wash pot or communal food bowl. Neither of these functions would be necessarily associated with church activities. The type would, however, be associated with the more mundane, day-to-day activities of a much more informal squatter occupation.

The large frequency of the yellow glazed redware in Strata I and II suggests a non-Spanish origin for this unknown type.

The increase of Colono ware from Stratum III to Stratum II suggests the presence of lower status Puerto Real squatters after the official closing of the town and movement of the main citizenry to Bayaha.

The distribution of kaolin pipe fragments to the post-1578 stratum strongly suggests English, French, or Dutch contact at the "deserted" town of Puerto Real (Noel-Hume 1970:296-312). Archeological evidence at such sites as St. Augustine in Florida indicate that pipe smoking was not the preferred form of tobacco useage by the Spaniards who apparently favored the archeologically elusive cigar (Deagan 1983:246).

CHAPTER XI SUMMARY AND CONCLUSIONS

This study provides the archeological and architectural baseline for further work at Puerto Real, and the physical data necessary to aid the Haitian government in the eventual reconstruction of the church as well as a large portion of the central sector of town, sacred and secular. The progression of structures at the church site mirror the life cycle of the imperial town of Puerto Real. The initial "beachhead" era of colonization is marked by a temporary structure made of local materials with its design influenced by the established aboriginal architectural adaptations to the tropical New World environment, the Indian bohio. Alignment of the palisade indicates the establishment of a grid-town layout during this earliest phase of occupation, 1503.

Puerto Real's grid layout suggests that it was modeled after the "second" Santo Domingo. The "first" was destroyed by a hurricane in July 1502 (Sauer 1969:106). This new Santo Domingo was built by Ovando later in 1502 and designed around a grid plan (Palm 1951:241). Perhaps the other fourteen perimeter towns established by Ovando on Hispaniola (1502-1504) had the same layout.

The transition from this early "beachhead" occupation to the mature phase of the town's life cycle is reflected in the rectangular, pole-supported and thatch-covered open chapel. This traditional building sequence of imperial Spanish liturgical construction is also described by Kubler for early 16th-century Mexico. Such an open chapel was a distinct adaptation to the New World environment and a unique addition to the architectural repertoire of the Catholic church (Kubler 1948:75). The traditional construction sequence first involved building an open chapel to serve as an interim structure in which to celebrate Mass while the formal church was being built. Once the main church was completed, the open chapel served as an efficient means of providing the large numbers of early Indian converts with a place to observe religious practices and to be instructed in the Spanish language, culture, and imperial procedures (Kubler 1948:322). As such, the open chapel represents an imperial instrument designed to enhance the church's efforts to effect directed culture change among New World aboriginal populations. Puerto Real exhibits the earliest known manifestation of this liturgical adaptation in the New World.

The mature stage of Puerto Real's life cycle is represented by the construction of a single-nave masonry church possessing elaborate cut-stone fenestration of gargoyles and columns on its exterior. Interior walls

were coated with a fine white plaster, portions of which possessed painted black-lined curvilinear designs, highlighted by floral design polychrome cuenca tile. Adjoining this structure was a walled masonry courtyard which perhaps served as the cloister.

Expansion of the liturgical complex included the establishment of a cemetery. The construction of an adjacent massive masonry structure believed to be a tower with a pole-supported, roof-tile-covered portico served to separate the cemetery and "sacred" area associated with the church from the "profane" activities of the town. In turn, archeological evidence suggests that a market area was situated in front and to the side of the church's main entrance, located along a major foot-traffic path. Taken together, all these factors serve to define the function of Building A as church: its central location, large size, ratio of dimensions, massing of structure, masonry construction, elaborate fenestration, attached courtyard and open chapel, orientation relative to an adjacent tower and cemetery as well as the burials contained therein, the placement of doorways and circular end window in a manner specified for liturgical structures of the period, and finally its location relative to what is believed to be an open-air marketplace. These patterns serve to substantiate the area of investigation as a prototype of the "traditional" Latin American liturgical complex, the centralized hallmark of the imperial Spanish grid town.

The final phase of Puerto Real's life cycle, that of its rapid decline associated with the 1578 order of abandonment, is marked by the razing of the masonry church and the establishment of squatter lean-to occupation within its remaining standing ruins.

It is apparent from this study that architecture as an artifact reflects the three main stages within the life cycle of the imperial Spanish town of Puerto Real. The archeological record documents the initial "beachhead" era of colonization, followed by a period of expansion and maturity, and culminating in rapid decline and final desertion. Use of controlled archeological excavation and analysis has provided the physical evidence to support this interpretation and has consequently added vital information to the scant historical record of the early period of New World colonization. Both formal and informal mechanisms of conquest were at work in Puerto Real.

Excavations have further established that the grid-town concept was implemented at Puerto Real in 1503 and that this layout adhered closely to the formalized rules of grid-town establishment outlined half a century later by Philip II in 1573 (Crouch, Garr, and Mundigo 1982:16). This same pattern is exhibited in the design of the liturgical complex, which followed quite faithfully the instructions for ecclesiastical construction formalized by Cardinal Borromeo in the 1580s (Borromeo 1857:17).

Both these examples exhibit the same pattern of initial and informal imperial control being supplanted by formal control at the same time the Spanish New World empire spread outward from its first foothold in the Antilles to its expansive colonial domains on the mainlands of South, Central, and North America. The archeological investigations of the church and central sector of 16th-century Puerto Real demonstrate that the Latin American grid town as an architectural planning concept was a formally developed tool of conquest designed in Spain, established on Hispaniola, and formalized in Tierra Firme. The continuing Puerto Real project thus provides important understanding of the role of such towns in Spain's conquest of the New World.

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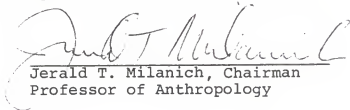
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BIOGRAPHICAL SKETCH

Ray Willis was born on May 18, 1949, in Toledo, Ohio. From the age of three he was raised in Pensacola, Florida, the second son of a commercial deep-sea fisherman. He spent his formative summers at his father's side at sea developing into the type of person that would choose archeology as a career and choose Haiti as the place to do it. At sea he learned from his father that any storm can be weathered, if each wave is taken head-on at a slow but steady speed.

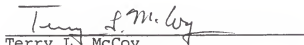
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Gerald T. Milanich, Chairman
Professor of Anthropology

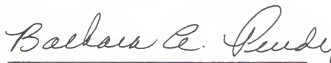
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Kathleen A. Deagan
Associate Professor of
Anthropology

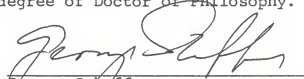
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Terry L. McCoy
Associate Professor of
Latin American Studies

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.


Barbara A. Purdy
Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.


George Scheffer
Professor of Architecture

This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Liberal Arts and Sciences and to the Graduate School, and was accepted for partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 1984

Dean for the Graduate Studies
and Research